USING IDEATION TOOLS FOR FACE-TO-FACE COLLABORATION WITHIN COMPLEX DESIGN PROBLEMS

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I am a creative, dyslexic, autistic designer and researcher who performs creative acts. I do not know how I do them but that I do. I do not see myself as different from other designers. My symptoms can be both a source of insight and a challenge. Eysenck describes the creative thought process to be 'over inclusive' with a larger sample of ideas in the search process. This process is evidenced by my professional experience in biotechnology, law, computer technology, art and design. However, as a researcher this description is not enough. I do not simply search or draw on tacit design or empirical knowledge for the sake of empirical knowledge. I envision then act through my ideas and creativity so I am also a finder. Charles L. Owen's characterizes the 'finder' as a person who exercises creativity through discovery. They are driven to understand and to find explanations for phenomena not well understood. The finder, as a result, is responsible for much of our progress in understanding our surroundings. Being a finder in the PhD Design programme, for me, is about envisioning how to make the most of creative collaboration to solve complex design problems by identifying and clarifying tensions between our changing contexts, tacit knowledge of design and existing empirical knowledge about ideas.

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This PhD is dedicated to

Ms. Melvina Spellman who taught me the meaning of home and that no matter where I am, I am never alone. Ms. Renee A. Spellman (1994), my Aunt Rey, my teacher and coach who inspired me to be better than I am. My Aunt Susan who guides me in a way that lets me fall and never fail. It is also dedicated to Mr. Stephen Bennett who believed me and believed in me Mr. and Mrs. Victor Lehto who showed me unfailing kindness.

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ABSTRACT

Keywords: collaboration, complexity, creativity, ideation, ideation tools, and practice-led research

The focus of this research are ideation tools and their ability to catalyse ideas to address complex design problems. Complex design problems change over time and the interactions among the components of the problem and the interaction between the problem and its environment are of such that the system as a whole cannot be fully understood simply by analyzing its components (Cilliers 1998, pp. I). Ideation for this research is defined as a process of generating, developing and communicating ideas that are critical to the design process (Broadbent, in Fowles 1979, pp. 15). Based on Karni and Arciszewski, who stated that ideation tools should act more like an observer or suggester rather than controller or an expert, I define design ideation tools as tools or methods that enhance, increase and improve the user's ability to generate ideas with the client (Karni and Arciszewski 1997; Reineg and Briggs 2007).

Based on a survey of over 70 ideation tools, protocol analysis of design activities, a web survey and semi-structured interviews, I conclude that designers and clients may not have sufficient knowledge of ideation or ideation tools in either testing or practice as a catalyst for generating possibilities and that measuring ideation tools based on how many ideas they generate is misleading because it relates creativity and idea generation but does not adequately reflect the participants' experience. This research suggests that participants' cultural perceptions of design ideation and the design process actively inhibit idea generation and that a shift from design outcome led ideation tool design to designing ideation tools that engage design contexts are necessary to effectively address complex design problems. This research identified a gap in ideation tools for designers to collaborate with their clients during the ideation phase to catalyse possibilities to complex design problems as the contribution to new knowledge.

INTRODUCTION

Practical and research challenges associated to enhancing and generating creative ideas

Complex design problems have an inherent paradox when design briefs predict design outcomes and the problem is not fully known. The paradoxes can be enforced by ideation tools and language when they affect the designer's ability to recognize, define and provide solutions outside the context of the design brief. I believe designing ideation tools for generating many innovative possibilities with the client during the ideation phase is difficult but a critical and worthwhile goal for addressing complex design problems.

Ideation is a difficult research undertaking because in fact finding terms it is, as Butler states, a subjective and thus private phenomenon, therefore inaccessible to direct scientific observation (Butler 2007, pp. 1). Ball and Ormerod state that ideation is also difficult to research within humanities where ethnographic approaches for understanding cognition in-the-head (i.e., processes, mechanisms, structures and representations that are inherently mental in nature) seems diametrically opposed to the study of cognition as a disembodied cultural construct. These relate more closely to the goals of sociology or anthropology, the disciplines associated with ethnographic methods. The analysis-for-a-purpose goals that characterize applied cognitive psychology are at odds with an apparent requirement for ethnography to be as theoretically and pragmatically neutral as possible (Ball and Ormerod 2000, pp. 149). Ideation is not observable but sketching, protocol analysis and controlled tests are used widely to record the design activity (Bamberger and Schön 1983; Shah and Vargas-Hernandez 2003; Bilda and Gero 2007). Unfortunately, these methods do not eliminate the challenges of relating effective methods and tools to improving ideation and conceptualization (Shah and Vargas-Hernandez 2003; Jin and Chusilp 2006). The difficulty in directly correlating ideation tools and idea generation could explain why there is a pragmatic focus on the design brief or the number of ideas generated to prove that it worked (Goldenberg et al. 1999). The design process can be a self-fulfilling prophecy where the design brief requirements are the driving force on which all other tools like creativity and the ideation tool are defined. This can make it easier to assume the components of the process must have worked because the design requirements were met.
Design ideation is also difficult to research in practical terms because it includes design, creativity, ideas, ideation, complexity and cognition. The aforementioned fields that comprise design ideation can be defined as concepts and/or characteristics of objects or processes. The terms themselves are a challenge because they do not translate into solid or objective fields of study and they often lack consensus of meanings. Their meanings can become more obscured when they are used across disciplines. This is exemplified by the many definitions for each word affirming their difficulty to define, validate and test. It would be a mistake to believe that when I mention ideation tools in product, graphic or engineering design that we are speaking of the same thing in the field of cognitive studies when in fact ideation tools have varied and evolving meanings and contexts in themselves.
Advancing our ability to find design solutions with ideation tools needs an integrated approach. I mean integrated in two ways. The first is an integration of methods for researching ideation tools so combining

epistemology and practice into a reflective ideation research field. Richard Buchanan made two comments that highlight a tension between words and their meanings within an integrated context. We have words like design that encompass ideas, methods and professionalized practice but without an integrative discipline of understanding there is little hope of sensibly extending knowledge beyond the library or laboratory in order to serve human beings (Buchanan, 2001 pp. 6). The other type of integration I am speaking of is linguistic. The words we use affect and inform the designer's ability to generate ideas. Language integrates a method of communicating ideas, spatial reasoning and cognition (Gumperz & Levinson 1996, Gleitman and Li 2002, Vygotsky 1962, 1978, Knutsson et al. 2007). While this research does not focus on the issue of reconciling language in design ideation, language has significant implications for the generation and communication of ideas. As Foucault stated language can be a transparent medium from which to deduce a metalanguage and on which to build statistical and mechanical models or a product of the individual psyche and ultimately subject to psychic transformation, a dim mechanism, a faceless determination, a whole landscape of shadow(Emerson, 1983 pp. 245-246). Design ideation, I believe is very much a landscape of shadow. Ideation tools have foundations of transient qualities namely their definitions and purpose. I have noted the following quotes regarding why and what creative ideas ideation tools are tasked to catalyse:

> 'Creativity has been usually defined as a person's ability to produce a novel and appropriate product (Lubart, 1994; Sternberg and Lubart, 1996; Amabile, 1997; Sternberg, 2001).' (Kim, M. H. et al, 2007 pp. 585)
>
> '...creativity underlies all economic advancement, then it seems to me that we can read economic history as a succession of new and better ways to harness creativity.' (Florida, 2002 pp. 56)
>
> 'this (creativity) is the one manifestation of existence that cannot so see itself as literal thing.' (Creeley, 1974 pp. 1029)
>
> 'Pioneers of the scientific study of creativity have often defined creativity in terms of the capacity to produce new or original ideas (e.g., Guildford 1950; Vernon 1989; Eyesenck 1994).'(Goldschmidt and Tatsa 2005, pp. 593)
>
> 'We start by defining creativity as a capability that enables the creation of systems that are patentable.' (Shai et al. In press)

There are many tools for different market segments but it is concerning that across the range of disciplines, the desire to harness creativity for goal-orientated creative approaches are not debated more. If design is strictly 'goal orientated' then this perspective will obviously have an effect on all aspects of the design process depending on who and what defines the goal. Designers may acknowledge and/or embrace the perception that design is goal oriented and that a designer's success is judged by how well he/her meets the desired goals (Shah et al. 2003). A goal oriented approach can be at odds with creative methods or outcomes that do not seem to achieve the goal. Garvin stated, for example, that creativity was evidenced by patterns of unanticipated departure from systematic development and routine (Garvin, 1964 pp. 3). Although she is speaking of creative process within a team, I believe this also applies to the over all design process as a problem solving and creative

approach. I will focus on how ideation tools address complex design problems by providing an empirical and practice based framework of design, creativity, ideas, ideation, complexity and cognition relating to design ideation tools so that the possibilities that could be generated are not constrained. It will be the task of another researcher to state whether the possibilities are 'good' or that they are 'creative enough'. It is from this point the important work of generating creative ideas for complex problems can avoid self-fulfilling prophecy or facilitating the design process of a predetermined design brief.

1. INTRODUCTION

    a) An inquiry into the domain of ideation tools through a design paradox (p. 13)

    b) The informal amalgamation of idea generation tools. (p. 15)

    c) An inquiry into the complex design problems. (pp. 19)

Ideation tools for designers to use with the client for catalysing greater possibilities to complex design problems are under researched.

2. CONTEMPORARY VIEWS OF AN IDEATION TOOL

    a) Within our technologically based Western society 'The Idea' originated as 'Eidos' in Greece. Currently, our design ideation directly contribute to the need for and also the acknowledgement of new design and research approaches to complex design problems. (pp. 22)

    b) Ideation tools for creative ideation tools have a critical role for addressing complex design problems (de Bono 1998; Dorta and Perez 2008; Metros 1985; Karni and Arciszewski 1997; Cilliers 1998, pp. 8; Bohm and Peat 2000, pp. 138). (p. 27)

    c) The pragmatic role of ideation tools for probabilistic or predictable creativity is contrary to cognitive research in creativity and idea generation. They do however, support a perception that economic goals and productivity are singularly attainable. (pp. 33)

    d) A survey of ideation tools for collaborative and creative catalyzation reveals a gap for client and designer collaborative tools to engage complex design problems. (pp. 40)

This chapter describes the research methods used throughout the thesis by cross-referencing the thesis.

3. METHODOLOGY

    a) Using practice-led research during design practice to capture information (p. 59)

    b) Conducting semi-structured interviews among co-workers

    c) Capturing and analysing design activities using protocol analysis

4. PRACTICE BASED VIEWS OF IDEATION TOOLS

    a) Practice led research or ‘research through design’ with Moixa Energy (June 2007 to August 2007) and Symbian (December 2007 to March 2008) exemplified conflicts that occurred during the ideation phase (Pedgley 2007; Archer 1999). (p. 61)

    b) I applied an existing ideation tool, TRIZ, to Moixa Energy’s design brief in order to highlight possible limitations. (p. 76)

I have invented a novel ideation tool that I call EiDOS. It was designed for use by designers and their clients. I have designed it with the intention of increasing the range of possible design outcomes. This is a useful innovation because design outcomes are critically affected by early decisions made during the conceptual or ideation stage (Thackara 2006, pp. 1; Goldschmidt and Tatsa 2005, pp. 593; Vygotsky 1998, pp. 6; Bateson 2000, pp. 229; de Bono 1971, pp. 6)

5. DESIGNING A COLLABORATIVE FACE-TO-FACE IDEATION TOOL

    a) EiDOS is designed specifically to increase possibilities by integrating orientation, dialogue and context that are recognized as key contributors for generating creative ideas (Benyus 2005; Buchanan, 1992; Chen et al. 2007; Corkhill and Guenter, 1969). (p. 80)

    b) The ideation tool is designed to generate greater possibilities therefore descriptions of the ideas are defined by using Set Theory to characterize the ideas of interest within the set of possibilities. (p. 87)

    c) EiDOS an algorithmic ideation tool for designers to navigate the ideation phase with their client was presented at The Big Picture (2008), Glasgow University (2009) Oxford University (2009) and applied during a consultation with Creative Lewisham (2008). (p. 89)

I will conduct protocol analysis of participants using EiDOS, TRIZ and a placebo to compare the participants' ability to generate ideas, and their experience of collaborative idea generation.

6. PROTOCOL ANALYSIS OF CONTROLLED IDEATION TESTS

    a) Testing an ideation tool in vitro can effectively situate design activity into components of each test, expectations of the test, possible outcomes and desired outcomes (Cross 2001 and Schön 1991).
    b) Protocol analysis and a constraint model; a model that can modify constraints as the process unfolds are used to frame an in vitro ideation tool test between EiDOS, TRIZ and a placebo (Kalay et al. 1990, pp. 49). (p. 101)
    c) A web survey was conducted for in vitro participants and non-participants to clarify what if anything they knew about ideation tools and how or if they used them. (p. 224)

This research identified a gap in ideation tools for designers to collaborate with their clients during the ideation phase to catalyse possibilities to complex design problems as the contribution to new knowledge. The following statements are made as findings from the research.

7. DISCUSSION AND CONCLUSION

    a) The research concludes that designers and clients may not have sufficient knowledge of ideation or

ideation tools in either testing or practice as a catalyst for generating possibilities. (p. 226)

b) The research concludes measuring ideation tools based on how many ideas they catalyse or generate is misleading because it relates creativity and idea generation and does not adequately consider the participant's experience. (p. 226)

c) This research suggests that cultural perceptions of design ideation and the design process actively inhibit idea generation. (p. 226)

d) This research suggests a shift from design outcome led ideation tool design to designing ideation tools that engage design contexts is necessary to effectively address complex design problems. (p. 226)

e) This research suggests that the creative ideas generated mainly at the beginning of the design activity may have inherently creative qualities but alone, they are not enough to effectively address design complexity. (p. 226)

f) This research supports an active incorporation of practice-led and empirical research as a process of ideation research. (p. 227)

I attended the 40th anniversary of the Design Research Society at the Open University in 2009. Paul Gough, Professor and Pro Vice Chancellor Research and Enterprise, University of the West of England, presented 'Light Touch, Deep Impact: Research Assessment Past, Present, and Future'. Impact, or the benefit to business a term taken from Lord Mandelson is now critical[i]. This research was situated within practice but the impact is hypothesized for future research trajectories and potential industry impact.

8. POSSIBLE TRAJECTORIES FOR FUTURE RESEARCH

a) For use within teaching – to advise student designers on how to improve their ideation process. It would also aid their use of ideation tools alone or with their client. (p. 238)

b) For developing the role of the facilitator in helping the designer and client during ideation. (p. 241)

c) For considering comfort and experience in the design of ideation tools. (p. 242)

d) For investigating alternative ideation research techniques that describe the complexity of the design activity. (p. 242)

e) For assisting in the further development of intuitive methods for co-generating ideas between designers and clients in complex design scenarios. (p. 242)

INTRODUCTION

An inquiry into the domain of ideation tools through a design paradox

The research developed from a theory based inquiry about how ideas were generated and the impact on the rest of the design process. I also wanted to know how it was possible to encourage the generation and selection of unknown collaborative ideas as design solutions. The intervention as such transformed the theory based inquiry into a practice based tool for designers. The research developed into an evidence and practice based investigation regarding how ideation tools could guide design approaches to be more effective in providing solutions for complex design problems. The research area suggests that there are significant interactions in the design process that have been generally overlooked in the development of ideation tools. The interactions influence how designers use ideation tools during the design process and the significance of the ideation phase outcomes. This observation is based on my professional design practice and empirical research that suggest interactions between the designers, clients, the design process, and ideation tools are complex. The interactions include communicative, cognitive, economic, creative and social disparities between the occurrence of creativity and cognition, the purposeful and economically dominated design process and the roles of ideation tools.

This research does not apply to all design fields. Given these general interactions, the specific types of design this research applies to are drawn from my professional practice. They were primarily graphic design, web design and branding. The participants in the protocol analysis were non-designers and designers in graphic, advertising, branding, architecture and product design fields further scoped the design research. As it relates to design research the field of study is quite large when one considers ideas and interactions. Teymur has written that there is a need to state which part of design we are speaking about,[ii] otherwise the research could contribute to the menagerie of definitions which lose meaning. The definitions as a result reinforce Buchanan's observation that 'no single definition of design, or branches of professionalized practice such as industrial or graphic design, adequately covers the diversity of ideas and methods gathered together under the label' (Buchanan 2001, pp. 5). This isn't a bad thing per se, but for design ideation it has led to many one off pieces of design research. Stating which part of design we are speaking about is of particular concern for design research, if design ideation research is to add to the body of empirical knowledge of design in a meaningful way. In order to avoid this predicament, design for this research is defined as a 'socio-economica' and, by its very nature, mental phenomenon and as such a resource of information that includes process, an object and discipline (Kryssanov et al 2001, pp. 329). This research is specifically concerned with design as a source of innovation to complex design problems.

A design brief for a complex design problem like an environmentally sustainable car is an example of a paradox where environmental, economic and social contexts can strain design as a source of innovation. If the design prerequisite is that the car must fulfil the definition of sustainability as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland 1989, pp. 784) then based on the future consumption and population growth, cars are not environmentally sustainable (Arrow et al. 2004). The design paradox occurs because the context of complexity here are the factors that lie

outside of the design outcome. Redefining complexity like Suh (2001), for example, who stated that complexity is defined as the probability of achieving the requirements (Holtta and Otto 2005, pp. 465) exemplify the paradox of probabilistic and deterministic approaches to complexity. The designer working within a client led process for designing an environmentally sustainable car may conduct research during their ideation and realize that the long term viability of an environmentally sustainable car may be at best paradoxical and at worst an oxymoron. Unfortunately, for the designer, not proposing a type of car to a client such as Ford, Ferrari or Jaguar is unreasonable because as Vermier has stated, 'instruments and artefacts are almost exclusively seen in the light of a narrow economic and technical concept' (Vermeir 2007, pp. 363). It is from my practice based experience with other projects that I learned that the designer can suggest something other than a car but they do so at their professional and economic peril.

The combination of terms, intentions and business relationships between the client and the designer are an informal amalgamation we accept. Unfortunately, this diminishes our awareness of the terms we use to describe the context like complexity and creativity because they are subservient to the end goal which is in most cases fulfilling or exceeding the design brief requirements.

The informal amalgamation of idea generation tools.

At first glance it's absolutely logical to question the study of additional ambiguous fields in an already ambiguous field of ideation but they have been informally incorporated already. Ideation is difficult in itself and focusing strictly on ideation tools within a contemporary design context of ' narrowing the wide range of possibilities until the design conforms to the design requirements' (Lidwell et al. 2003, pp. 118) could be easier and a more efficient research approach. However, ignoring the amalgamation of these fields can make ideation tools less effective. The informal amalgamations of the design approach and the relation between clients and designers in the design process are my primary focus. They are the over all machine where bits like clients, designers, ideation tools, ideation and design interact. This is the prevalent commercial design ideation tool research approach. It is similar to Chiapponi who stated the design process is a two-way relationship between reality and design but he takes a hierarchical and deterministic design process approach (Chiapponi 1998). The distinction between a hierarchical or deterministic approach is the assumption that all the information is available and at what point in time is the design outcome known? Deterministic approaches rely more on the design brief which represent the end design. It is fair to ask at this point if design ideation should be limited to the design brief or is it about generating creative possibilities and solutions that cannot be foreseen? The crucial difference between this research and other pieces of research is that this research focuses on the latter for less predictable outcomes. The reason for this is that the global challenges like poverty, war and climate change are now design problems and they represent problems that are growing in complexity. This research is not the first to incorporate greater context into design solutions. The United Nations Development Programme (UNDP), in 1983, adopted the idea of human development, which considered issues of culture, social equality, health, nutrition, and education. Papanek and Bonsiepe recognized these issues as design challenges (Margolin 2007). Ideation tools are critical during ideation and in short, ideation tools are already assimilated as a method for fulfilling design requirements by incorporating creativity, ideas, complexity and cognition.

As a designer, our contribution like our profession is not well defined or understood. Popular hierarchies of professions affect the role of the designer where doctors, engineers and lawyers are considered major professions. Nathan Glazer depicts design as a minor profession and secondary to scientific knowledge (Schön 1985, pp. 5). [iii] As a result of being viewed as a minor profession, the design process reflects the client's cultural perspective and the designer's skill, creativity and intuition may not be given the same priority. Science and the client currently have opinions that are of greater cultural value even though science as a traditional form of study is rightly criticized in my opinion by Bredendieck. He stated that science provides 'information without clarifying its position in the environment and in neither society, nor its relationship to the material and content of its work' (Bredendieck 1962, pp. 21). There is little evidence to support an assertion that design and science have enough mutual respect in their field or culturally to inform each other as sources of knowledge. The imbalance can be associated to a cultural perception of design and the value of design from within the field and from without. Bredendieck described, for example the attitude and output of the designer during the 60's. Bredendieck goes on to make three very important and linked points. The first is that he draws a difference

between the accession of technology over design as a matter of intention. That designers do not consciously use their intellect. I believe this is in part due to the nature of design and that through design it is difficult to gather and quantify knowledge. This tacit knowledge that is often at odds with the more acceptable empirical or epistemological knowledge. I believe this is also a contributor the plight of the designer and design. It comes about because technology can mimic the designer's actions through software, but the task of the designer is not well understood enough to realize that the computer is not a designer. The computer does not create solutions. Without the designer to recognize this themselves and contribute to a knowledge of design the task of competing is difficult. This brings up the second point where Bredendieck states that the designer is taking the rear position when they once avant-garde. While this may be true in a limited sense I believe it fails in light of the evolution of creativity. The changes in definition and association continue as a conversation of creativity. The role of the designer is slowly becoming recognized in its own right. This includes recognizing cognitive associations to either one kind of thinking and another. I agree with the last point he makes relates to an over reliance on native intellect from both science and design. During the 90's there was a trend where technician was overused as designer may be now. The nomenclature of occupations is not as strong for designers as it is for bankers and this is an important point. The field of design must vigorously pursue a course of distinction as a field of its own through an expansion of research and practical knowledge (Bredendieck 1962, pp. 21).

Blau and McKinley provide a cultural glimpse into how ideation was perceived in the 70's by studying architectural firms. They provided a definition of ideas as the substance of patterns of thought but they also stated that 'idea research had been generally neglected in American quantitative sociology' (see Birnbaum 1960; Barber 1975) because ideas are more evident in science than in other fields (Blau and McKinley 1979, pp. 200). Their statement contributes to counterproductive and presumptuous perceptions regarding the value of ideas and who can develop them. Scientist and designers for example make casual and blatant associations within their fields of study that distinguish types of thinking. Chusilp and Yan defined the iterative process of design as a transformation from existentialism to pragmatism. Designers transform 'The Idea' from an existential process into the practical and pragmatic world of measurable results (Chusilp and Yan 2006). Their definition is reiterated by Richard Buchanan who provided a historical reference of Aristotle's Poetics, the Greek word for "making,", within a contemporary context of productive science and applied it to the study of making "useful" objects. While Buchanan, Chusilp and Yan provide the transitions as definitions of design Narváez and Fehér alternatively provide an important cultural function of design. They describe design as 'a part of culture that incorporates two processes: the material process which also is symbolic-constituted by artefacts, tools, and environments produced by human beings, and the nonmaterial process, "an idealized cognitive system; a system of knowledge, beliefs, and values that exists in the minds of members of society." Nonetheless, both concepts are always interdependent; i.e., the presence of material culture relies on non-material culture, and vice versa' (Narváez and Fehér 2000, pp. 38). Their characterization highlights an on going dialogue between existentialism and pragmatism as opposed to what I interpret as a one way process of production. Cache states that we should not be bound to the Cartesian concept that our ideas or internal images are limited to an

external object (Bernard 1995 [iv] and Lecusay et al. 2007[v]) and I believe this applies to our approaches to complex problems. We should not be implicitly limited to external objects or explicitly by design briefs as representations. Bachelard wrote in The Poetics of Reverie (1960) about relationships of 'The Idea' and the imagination and revealed their importance as a part our existence. Bachelard, Narváez and Fehér provide a more creative and problem solving role for 'The Idea' in design but pragmatism is more dominant because it accounts for the 'purpose' of ideas in design. It is for these reasons that the definition of 'The Idea' as a basic element of thought is important. The definition of 'The Idea' does not require divination, external justification, measurable results nor is it an exclusive experience of a group, deity, individual or object.

Design's engagement is inseparable from Western culture and this relationship reflects the designer's conception of 'The Idea' as much as the designer contributes to the cultural concept of 'The idea' through design. The designers' creative talents and ideas within in this context continue to be geared towards pleasing the client. When Papanek sees design as a bridge between the human needs, culture and ecology, he recognizes that designers plays a key role in contributing to culture, facilitating solutions and envisioning the future (Cross 1982, pp. 225). If we consider design as a bridge that effectively connects ideas and business then as ideas change so does business. This is not the case because business remains generally the same. The criterium of success is monetary and implies unrestricted growth and unrestricted resources to either obtain or increase profits. Design is a tool for innovation facilitating 'the new conventional wisdom that technological innovation is essential to economic growth and that economic growth – as expressed by rate of increase in Gross National Product – is a sign of national economic strength and vitality. New products create new markets. New processes reduce the cost of existing products, or permit improved products to be produced without increase in cost, thereby extending markets' (Schön 1967, pp. xv and Montgomery 1999, pp. 159). Tarnas and Schön recognized the critical role of Western culture in defining our world views of stability and change. Schön states, 'our present attitude toward change is essentially the view of Parmenides. We conceive of our institutions - nations, religions, business organizations and industries as enduring. Change of values is seen as deviance, undependability and flightiness. Values are presumed to be firm and constant. These dominant perspectives of either of how ideas are useful or how they are applied for business and profit cannot accurately represent the complexity of reality which designers are tasked with finding solutions for. Schön has also noted that 'since the turn of the century, however, it has become increasingly difficult to sustain this form of self-deception. The Parmenidean attitude toward change suffers as the rate of change increases. Too much has happened to laws, views of the world, values and institutions within the span of one man's life. The principal source of the difficulty is in the process of technological innovation and in many forms of social change which have accompanied it and resulted from it and which now, as technological change has become institutionalized, cause it' (Schön 1967, pp. xiii). Narváez and Fehér stated that the conception of science has encountered severe stumbling blocks in dealing with reality as a result of a growing awareness of complexity theory (Narvaez and Fehér, 2000) and this level of complexity is found in varying degrees of design problems. Schön and Dilnot attribute like others (Blau 1979; Madge 1993; May 2006; Gerencser 2008; Young 2008 and Margolin 1998)

the rise of technology to our increasingly complex lives and design contexts.

An inquiry into the complex design problems.

According to Cilliers, complex design problems are a type of design problem where the interactions among the design elements, and the interaction between the design elements and its environment, are of such a nature that the design problem as a whole cannot be fully understood simply by analysing its components, since they are not fixed and change over time (Cilliers 1998[vivii]; Chiapponi 1998[viii]). Complexity has forced us to change our perception of the world around us. Berry 1987; Chernov and Hutter 2007; Cilliers 1998; Gleick 1987; Hofstadter 1979; Lakshmanan 2004; and Simon 1996, conduct research on the topic of complexity and they confirm that complexity affects the ability of design and technology to provide effective and relevant design solutions. Complexity and design have common origins in teleology going back to the Bauhaus (Reigleluth et al. 1993) This relationship has been challenged within design with systems theory. Reigleluth offered a way to describe or imagine complex realities reflected in the work of C. West Churchman and regarded the opportunities that system theory has over 'scientized thinking' because teleology is at the heart of creative inquiry but there is no purpose to creativity other than the one we perceive (Reigleluth et al. 1993). As a result of this paradigm shift, design has the potential to excel because it can actively incorporates multiple contexts.

If we use the car as an example, a growing complexity has manifested as a result of the function of the car over time. The car was and continues to be a status symbol of freedom and wealth but with the advent of technology and through Ford's mass production it became affordable for almost everyone. The combination of growing populations, increased economic accessibility and decreasing resources poses new design and technological challenges. In essence the many contexts of the car has made it complex. Complexity as a research subject and characteristic of design problems is a critical element of this research. Differentiating complexity for this research from the more popular definitions refines the research scope to clarify why a more effective ideation tool is necessary.

Complexity, designers, design problems, ideation and ideation tools can all have a level of complexity, given either a situation or context. This is illustrated through the growing body of work on complexity from inside (Roth 1999[ix]; Storkerson 2008[x]; Schön 1991[xi], Young 2008) and outside the design profession (Maier and Fadel, Herbert Simon and Hutchinson et al. 2002). As an example in science Bohm and Peat have stated that fragmentation or a disjunction exists between tacit tools used by scientists and an evolving change in context of the work. This has diminished the scientists' ability to provide solutions to complex problems. This observation was also paraphrased by Gregory Bateson, a biologist, who stated that an 'ecology of ideas' is necessary to understanding the multitude of relationships between man and the environment.[xii] Their comments are not limited to the field of science; in fact the very nature of understanding complex problems is an affirmation of the design field.

Richard Buchanan related design and complexity when he recognized Rittel's definition of 'wicked problems' as a complexity inherent to design problems that designers face. Wicked problems are a "class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and

decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing (Buchanan 1992, pp. 15). Nigel Cross differentiated design problems or 'wicked problems' from problems that other fields face. He stated that wicked problems are not the same as the ‘puzzles’ that scientists, mathematicians and other scholars set themselves. They are not problems for which all the necessary information is, or ever can be, available to the problem-solver. They are therefore not susceptible to exhaustive analysis, and there can never be a guarantee that a ‘correct’ solution-focused strategy is clearly preferable to an ongoing analysis of ‘the problem’, but the designer’s task is to produce ‘the solution’. He goes on to suggest that the designer's approach is to seek, or impose a ‘primary generator’, that both defines the limits of the problem and suggests the nature of its possible solution' (Cross 1982, pp. 4). In response, I would argue a more rigorous approach is necessary given the prevalence of mental habits that can permeate design approaches. While I believe that 'wicked problems' are different to other types of problems, I do not define this problem based on the field of study whether it is design or science. I believe Nigel is making more of a statement regarding the approach rather than nature of the problem. While we have defined 'wicked problems', design approaches and ideation tools to facilitate these functions, I believe the whole topic as it relates to complexity can be realigned according to the nature of the problem. It is after we have realigned the design process as a solution finding process that we can decide on the types of approaches and tools that are necessary to affectively address them. Nigel Cross broadly defined design problems as 'wicked,' citing Rittel's definition but there are many functions of design and some design problems are simple and may not be complex but they may be complicated (Cross 1982, pp. 224). It is because of the generalization of the definition to fit all design problems that I would like to provide a separate definition that applies to this research. Without this, there is an inherent implication that this tool is necessary or can help all design problems and this simply is not the case. Based on Cilliers' 10 characteristics of complexity (Appendix, pp. 294) I define complex design problems for this research as a design problem comprised of components whether they be many or little, they are non-linear components and they have dynamic interactions that are changing over time, there is no resting state at which they fall into equilibrium and the components will not have enough information to address the whole problem because there is a lack of awareness between the components and between the components and the whole system.

Bird (2003), Blau (1979), Chen (2009), Chiapponi (1998), Cross (1999), Dorta and Perez (2008) among others have written about complexity as an attribute of design but how these considerations are assimilated into the design of ideation tools is in comparison imperceptible. Ideation tools that are being designed to simultaneously address complex design problems and fulfil the client's design brief have resulted in the augmentation of technology as more justified and efficient in the methods of devising design solutions (Morelli 2002). One significant problem is the computer's finite set approaches and data. Cybernetics, Turing machine and quantum computers (Deutsch 1985)[xiii] are methods for partially replicating the complexity found in the human brain. For now, none of them can currently replicate the complexity or creativity of a human mind (Penrose 1989; Apter 1969; Anderson 1964; Negley 1952; Morhfeld 1974; Deutsch 1951; Bruner 2006). If computers are going to deal with complex design problems the computers will have to be equally complex in

order to devise solutions (Cilliers 1998). This includes quantum computers, a concept that is beyond our grasp and this is where I see ideation software and knowledge bases falling far short as a creative problem solving method. Cross and Young recognized the benefits of technology but it's hard not to recognize technology is also a method of control and prediction even in the study of communication. This level of control can hamper the user's ability to generate creative ideas. I agree with Whitehead who recognizes that technologically predicted solutions for complex design problems are difficult so for this research it is more important to know the nature of the problem than the solution. It is because of this gap I am suggesting that ideation tools take the role of catalysing ideas and generating more possibilities between two stakeholders over a reliance on technology generating design outcomes in social and environmental isolation.

CONTEMPORARY VIEWS OF AN IDEATION TOOL

Within our technologically based Western society 'The Idea' originated as 'Eidos' in Greece. Currently our design ideation directly contribute to the need for and also the acknowledgement of new design and research approaches to complex design problems.

Generating ideas at the beginning of the design process is critical to the financial and functional outcome of the design but the impact between idea generation and tools that have been historically defined according to the prevalent cultural context. I review the origins of 'The Idea' so that contemporary design ideation is contextualized as a function of generating collaborative ideas not as a function of design. Defining 'The Idea' within historical terms is critical to this research because our current definition of 'The Idea' influences the impact of and significance of ideas in the design process and design ideation as a matter 'of generating, developing and communicating ideas...'Broadbent, in Fowles, 1979:15 (Jonson 2005, pp. 613). 'The Idea' has Greek grammatical origins in 'eidos' that translates to 'idea and image' (Keyser 1998, pp. 130). Although I would initially take eidos as an advocation of the phenomena of thought and the changes that occur from thought into object or to another thought. Instead the definition is a move towards distinguishing and prioritising what can be measured. This can be seen as the transition of 'The Idea' as an extension of an 'inner measure' to objective and measurable knowledge. Bohm describes the nature of measurement in Ancient Greece not as a comparison of an object with an external standard or unit but as an outward display or appearance of a deeper 'inner measure', which played an essential role in everything. When something went beyond its proper measure, this meant not merely that it was not conforming to some external standard of what was right but much more, that it was inwardly out of harmony, so that it was bound to lose its integrity and break into fragments' (Bohm 2007, pp. 25-26). Inner measure was later objectified when Plato introduced the name and the conception of the 'Idea' - in short, that he was responsible for the transformation of the Socratic ethics and logic of definition into metaphysics[6] (Lovejoy 1982, pp. 34). The Platonic idea contributed to the scientific method and subsequently a method of comprehending 'The Idea' in other than phenomenological terms[xiv.] As a result Whitehead states that the Platonic idea reflects that "every right formed conception has its solid basis in objective reality, and that we can therefore attain a knowledge of things as they are independent of our apprehension of them" (Whitehead 1934, pp. 36). While I believe that objects exist outside of our consciousness so that we may can obtain knowledge of them, I do not believe that the process of generating ideas is limited to a singular concept of objective reality that is grounded only in objects. To ignore the change and transformation of ideas into objects contributes to convenient limits of what is or is not possible. The objectification on one hand prioritises measurement and prediction, but by doing so 'The Idea' resulting from a process that is both phenomena and consciousness is marginalized as a creative activity. This shift obviously favours science and reflects 'The Idea' being associated currently with an outcome, a subjective outward measure and method of prediction.

The meaning of 'The Idea' changed when math begins to represent the belief of an orderly universe through

Pythagoreans, who ‘taught that these forms are brought to light first in the human mind, and then in the cosmos’ (Tarnas 1993, pp. 46). It is further understood that 'the Pythagoreans regarded the universe as a large musical box, the organism as a well-tempered instrument, and all material phenomena as a dance of numbers' (Koestler 1989, pp. 313). More importantly, the relationship between the soul and the world was reduced to mathematical explanation. Based on statements like ‘the human mind can arrive at the existence and properties of the mathematical forms, and then begin to unravel the mysteries of nature and the human soul’ (Tarnas 1993, pp. 46) we can observe how mathematics became seen as a tool for understanding not only our ideas but also our very souls. The universe was depicted as intelligent and orderly and this same intelligence was reflected in man and was central to the Hellenic period (Tarnas 1993, pp. 47). In contrast to the universe being orderly and mathematical, man was not viewed as having an inherent understanding of the universe. Homer had viewed the capacity of the soul, not as self-sustaining but as vessels...they function as transit stations for equally loosely connected events such as dreams, thoughts, emotions and divine interventions. There is no spiritual centre, no 'soul' that might initiate or 'create' special causal chains…’ (Feyerabend 1987, pp. 139). Examining this shift in particular I must also acknowledge that I am writing within a culture defined by existentialism and therefore this is but an interpretation that could change based on the unknown shifts in perception of the self.

A change occurred when mathematics was coupled with the introduction of the Nous (a divine being) as opposed to a mythology of gods. The Greek concept of ‘Nous’ signified a homogeneous and divine order in the world and as its recipient we could be empowered to bring order to the world. The Nous was a result of Neo-Platonism, where Nous, through divination/perfection encompassed the intellect and the soul as different states of the divine mind and a source of order’ (Tarnas 1993, pp. 85, 45). Imposing order in this fashion marked the separation of man from nature and the end of the Golden Age as a result of man's invention, ambition and greed (Mason 2003, pp. 75). The concept of order and chaos is significant. A concept of order and chaos is currently evident in Western culture through science and design. Science asserts control as a need to understand through correctness, and thoroughness to remove uncertainty. (Owen 2006, pp. 20). Design as part of its definition is a ‘conscious effort to impose order’ (Papanek 1974, pp. 17). The definition makes clear how design facilitates a means of ‘subordinating the elements and the individual to a man made order, as could only inevitably happen, of exercising control over them’ (Mykheeva et al. 1991, pp. 47).

It is through Christianity that we see two significant changes in ‘The Idea’. One change is the evolving Judeo Christian polarization of ‘good and evil’. The other change occurred when ideas, a basis for knowledge, were arranged within a ‘divine mind’ (Tarnas 1993, pp. 106). This transformation occurred after the Nous, but it is most affected by Jesus, the decline of the Roman Empire and the rise of the Orient and barbarians. Our ideas, instincts or beliefs became subservient to science within Western culture highlighting ‘two apparently contradictory or at least incongruent truths maintained simultaneously, one religious and one scientific’ (Tarnas 1993, pp. 243).

A growing faith in science pushed aside alternative ideas and ‘symbolic representations’ leading to Platonic and

Aristotelian philosophy as the dominant way of thinking over Eastern philosophies in the last few centuries (Ponting 1991, pp. 141).

The Romantic period is important in the development of 'The Idea' regarding whom could generate ideas. The Romantic period is also related to the recognition that aspects of reality contradict orderly behaviour or a theory of chaos[xv] in science that was in part brought to light by Poincare (1854-1912). His observations confirmed an inability to predict the behaviour of three bodies also known as the 'three-body problem'. During Romanticism observation, comprehension, and relations between ideas and objects occurred through 'human nature, creativity, intellectual freedom, the fantastic and the macabre' (Collyer 1997, pp. 195). This is in contrast and possible reaction to a long period of religious constraint. The change in viewing 'The Idea' as part of a divine mind to a formulation of a person's mind was a significant development. It was thought that artists were genius and elite in their ability to create and be creative. Artists were exalted above other men (Kristeller 1983, pp. 107). When Locke stated that all knowledge of the world rests on man's sensory experience we move away from the macabre of Romanticism into the very real world of facts and scientific observation. 'Not until the Enlightenment did philosophers such as Locke come to reinterpret the notion of 'The Idea' as an ordinary initiative of the individual mind' while at the same time he compared the mind prior to experience to "white paper, void of all characters." Locke's views on ideas relied on experience and perception, as they contributed to empirical science. The rise of the artist and the scientist also gave rise to them being viewed as different types of thinking, although science was also considered a means of knowledge. Categorizing the types of thinking into a scientific or technological thinking and artistic thinking is precarious, especially when we can see the creative mind of Einstein who believed embodying creativity as essential (Koestler 1989, pp. 171-172). The differences between scientific and artistic thinking also extend into the field of thinking in itself. Dewey for example makes a distinction between reflective thought and high-level thinking such that high-level thinking is more systematic. Bloom on the other hand associates high-level thinking and the amount of abstraction involved. The field of critical thinking is extensive and includes contemporaries Ruggerio (1988), Teays (1996). Neither of the descriptions of high level thinking incorporates creativity within their scope. In my opinion there is such a push into understanding the nature of thinking and a categorization that characteristics of unpredictability and novelty are obscured or ignored for what can be known. Ignoring or minimizing creativity impedes our knowledge about thinking as a process except through arbitrary means of hierarchy.

Science continues to make progress as a method of understanding relationships between ideation, anatomy and physiology. These steps forward are not always based on the evidence but with the intention to rationalize measurement, needs for control and prediction. Until Vogel and Bogen, theories regarding which part of the brain were creative or generated ideas were not rigorously investigated physiologically and anatomically. Their surgery in 1962, when the brain (corpus collosum) was severed in order to control severe epileptic seizures provided a starting point for interventions and explanations for how we generate ideas and associated anatomy of the brain. The surgery resulted in research of the right and left hemispheres and their functions. It was deduced that the left-brain was for logic and the right was for creativity. Handedness as a result is an example

where we have associated a genetic or physiological determination that can explain who is more creative. It was later that Katz and Hattie established that left-handed people had no more or less creativity than a right-handed person. Marian Annett conducted research on association areas of the brain that explored cognitive and physiological relationships related to handedness. The very large areas of cortex that are silent on electrical stimulation are traditionally described as association areas. Associations, first of ideas and later of stimuli and responses, were assumed to be the foundation of intelligence. Her research did not support handedness as substantiation of either group being more creative. In the presence of evidence that would contradict teaching based on left or right brain superiority, Blakeslee, Harris, Martin, McLendon, Rico and Claggett, Yellin and Buzan none-the-less advocated right-brained learning within education (Brueggeman 1989, pp. 127). Right-brained learning shows how the activities on which intelligence depends, such as learning, memory, recognition of people and objects, language, and decision making are related to cortical functions (Broadbent & Weiskrantz 1982). It however exemplifies a pursuit and rationalization of these relationships that were at once phenomenological, transferred to a higher power, endowed to man and then to a type of man can be misunderstood and manipulated. Our knowledge regarding how we generate ides is fragmented (Annett 1985, pp. 29-30) and taking a less holistic approach or ignoring what empirical evidence we do have creates dangerous foundations for ideation tools to be developed.

'The Idea' is an integral part of the design process within Western culture's postindustrial society. It is very difficult to separate 'The Idea' within the field of design apart from either the purpose, the designer or the context of designing. The design process is firmly placed culturally and philosophically between pragmatism and existentialism. Their influence is not casual since they are recognized as two of the three philosophies of the industrial society alongside Marxism.[xvi] Existentialism emphasizes 'distinctively human realities' so that 'to even speak of a subject and object as distinguishable entities is to presume more than can be known.' Environmentalism is an example where we have on one hand such a complex environment that our impact (carbon emissions or population growth) can't be accurately determined while an argument can be made that the best thing for the Earth in those terms would be human extinction. We are left with a scenario where we cannot accurately gauge the impact of our environmentalism versus continued human activity on the planet and the biosphere. Existentialism leaves us with only an idea, intention and perspective to move towards based on our individual concepts of environmentalism. Pragmatism is defined as a principle method of estimating the practical value and result of philosophical conceptions. In essence, this applies to ideas where we can also state that beliefs are considered rules for action and the whole function of thinking is but one step in the production of habits of action (Bawden 1904, pp. 422).

More recently, Maturana, Varela and Hameroff have contributed to a fundamental understanding of 'The Idea' resulting from ideation as a cognitive trait of being human. They have described irreducible characteristics which contribute to a fluency and novelty that cognitive psychologists consider as the primary measure our of ability to generate ideas[1,2] (Shah et al. 2003, pp. 111; Maturana and Varela 1998, pp. 40). Their contributions are critical because this research works on the premise that the participants in the design process can generate

ideas regardless of their occupation or preferred problem solving method. Participants from different disciplines like sociology will have different definitions of thinking and ideas as illustrated by Geersteen when he researched high-level thinking (Geersteen 2003, pp. 1). Hameroff's 'Funda-mentality' has provided a broader view of cognition. It relates the conscious mind to a basic level of the universe. This is similar to Rupert Sheldrake's morphic resonance; mental fields that provide communication channels and the memory of nature (Sheldrake 2005). A group consciousness on this scale is beyond this research. Being that the focus is on the design process, it's important to recognize that pragmatism is a reason why such importance is place on the purpose of ideas within design. It looks to results, and actions not reflection or process (Maturana and Varela 1998, pp. 24). Pragmatism allows participants of the design process to question the value of an idea by pre-empting the material outcome. This translates easily to ideation approaches that can inhibit long-term solution finding and perpetuates immediacy as the most obvious solution. Pragmatic notions such as "utility', 'to work' and 'to function' have to be rethought' (Vermeir 2007, pp. 374) otherwise developing solutions for complex design problems are made worse by these self-inflicted paradoxes.

Ideation tools for creative idea generation have a critical role for addressing complex design problems (de Bono 1998; Dorta and Perez 2008; Metros 1985; Karni and Arciszewski 1997; Cilliers 1998, pp. 8; Bohm and Peat 2000, pp. 138).

Ideation tools have a firm foundation within the design process through 'the development of techniques and tools to assist in the problem solving and invention' (Ross 2006, pp. 120). There is a strong tradition within engineering for improving the process and quality. Ideation is a critical to the design process especially in terms of reducing cost and waste but innovation and collaboration are rarely mentioned (Matook and Indulska 2009). According to chief information officers in a Delphi survey conducted in 1993, creative ideas are critical for developing novel possibilities to address complex problems. Designing a tool that encourages alternatives within this context and directly affects the ability to transform the process of generating ideas into profitable design outcomes is obstructed by designers and clients alike. Bohm has stated, communication is breaking down everywhere (Bohm 2007). This breakdown affects fundamental communication and the effectiveness of design ideation (Black 1999; Bakker 1997) because communication is recognized as one of the most effective methods of generating creative ideas (Buchanan 1992[xvii]). The social and cultural relationship between the client and the designer are as such that the designer is charged to carry out design tasks as directed by the client (Lauche 2005, pp. 191). Papanek however points out the shortcomings to this approach. Papanek argues that designers and architects are deeply implicated in the current ecological crisis, because they do not speak out often enough to their clients (Bakker 1997, pp. 128). Any approach for improving or changing the ideation process needs to actively incorporate both the client and the designer in a context where they collaborate otherwise they will continue to result in less effective solutions. This is reflected by Shai as a key element for developing creative conceptual design, although they propose restrictive definitions of creativity that leads to a device or a system that is patentable (Shai et al 2007). There are insufficient tools for the designer to engage the client. It is both useful and necessary that ideation tools are designed with collaboration of the main stakeholders in mind. Industry estimates characterized cost saving to affect between 75-85% of the manufacturing and marketing support from design ideation alone (Dahl and Moreau 2002, pp. 47). It's obvious why ideation is coveted and why changes to it are difficult. Unfortunately, the economic value and success of ideation in its current form complicates ideation interventions. As a result ideation, the stakeholders along with artefacts cannot be so easily removed as objective parts (Riches 2000, pp. 669).[xviii] The interactions between the client, designer and design process are propagated by popular culture via methods for being more efficient. 'Thin-slicing' and 'strategic intuition' are two examples for making the most of the ideas through action. 'Strategic intuition' is defined by Duggan as a form of intuition that gives you an idea for action and places it firmly in the field of strategy' (Duggan 2007, pp. 2). The methods blur our perception and force design outcomes, designers, clients and their ideas into one seamless process of productivity. 'Thin-slicing' is defined by Gladwell as an 'ability of our unconscious to find patterns in situations and behavior based on very narrow slices of experience' (Gladwell 2007, pp. 23). 'Thin-slicing' can substantiate quick decisions based on prior experience. 'Strategic intuition', like pragmatism, is defined as an actualization of ideas to obtain a desired outcome. These approaches are

similar to how the designer and client function now. They can invalidate a need for a 'period of incubation' or 'fertile anarchy'' (Koestler 1969, pp. 225-226).[xix] They can contribute to and result in the client's perception that the design process is a closed strategic exercise. Strategic exercises like 'Thin-slicing' can be so focused that it is ineffective outside of it's limited context. Connetti for example stated that 'countries are more anxious to protect their productivity than their people. This is evidenced by the fact that in this century there are going to be more goods produced than man can use' (Canetti 1962, pp. 466). This isn't coincidental given that if everyone is using a method like 'thin-slicing' to improve their economic standing by selling, buying and making things then it's difficult to argue against the strategic role design plays.

I believe there is an unhealthy tension between strategy and creativity. There is a creative tension when innovation is needed but that is not the tension I am describing. I specify the tension caused by industry wanting creative ideas as long as they are the ideas they asked for. Creativity in this sense is being used for strategy, but in the scope of solving complex problems. Strategy in my opinion should be developed around creative ideas. The designer's creativity or 'the principle of novelty' (Whitehead 1929, pp. 31), is a critical tool for problem-solving, but during the design process, the exploration of solutions becomes limited. It is essential for this research that creativity is clearly defined historically and with relevance to design. Kristeller describes the word creativity as a relatively new word therefore; defining creativity will start with the root word 'create', which originated in Greece as poiein. Kristeller and Creeley[xx] provide detailed historical accounts for the term 'creativity' within Western culture. They provide a solid definition in which novelty and risk are inclusive. Kristeller's definition coincides with Bohm who states that creativity has a quality of 'originality', 'newness' and lacking of 'preconception' (Bohm 2007, pp. 4). I am combining Bohm and Kristeller's definitions of creativity into a new definition for this research. Creativity will be defined as the ability to make or design a unique or novel artefact as a result of the designer's activity. They draw on memory and take a risk that cannot be anticipated by planning. This definition allows creativity to be more than an intangible and subjective characteristic by invoking action and risk taking.[xxi]

Technology based creative ideation tools are currently one of the most significant trends as it relates to defining ideation's purpose and scope (Kim and Maher 2008; Kokotovich 2007; Jonson 2005; Cross 1996). I view the emerging technological innovation as a tool for advancing capitalism. I see them as an economic driver contributing to J. A. Schumpeter's[xxii] 'creative destruction'. Although Schumpeter describes creative destruction in terms of the capitalist engine that is fed by new consumers goods, new methods of production or transportation and the new markets that incessantly revolutionizes the economic structure from within, incessantly destroying the old one and creating a new ones (Aghion and Howitt 1992, pp. 324) I believe ideation tools are critical for creatively influencing the rest of the design process and in that they facilitate a creative destruction by being less than they are in their capacity to generate creative solutions. Based on the functional definitions of design and ideation tools the role design and creativity have had on the success of capitalism is tenable. Pragmatically, creativity has shown itself to be useful economically that at the same time narrows the contribution. Technology based ideation tools that are designed to efficiently develop solutions

confirms a need to increase possibilities, not limit them. It is for these reasons that this research is critical of applying technology to creativity. There are too many definitions of creativity that are design dependent. They often include an aspect of purpose inherent to design, but purposeful creative outcomes can be self-defeating if we consider 'the greatest creativity is found in creative pursuits undertaken for the sake of the activity itself, and not for the sake of some other end (Amabile et al. 1976, 1990; Amabile & Hennessey 1992; Conti, Amabile & Pollack 1995; Csikszentmihalyi 1996; Koestner, Ryan, Bernieri, & Holt 1984; Lepper & Greene 1978). Bohm also cautions us in stating 'when creativity is transformed into accomplishing a useful purpose, or goal, we will have an assumption behind it as to what is useful, and that assumption is going to limit us' (Bohm 2007, pp. 20). The assumptions can marginalize creative ideas and as Papanek states designs as a result are frozen (Papanek 1995, pp. 64).

There have been many attempts to formalize an ideation process beginning with the initial proposal for brainstorming (Osborn 1957). Ideation tools include methods designed for designers and non-designers alike like mind mapping or brainstorming. Goldenberg had commented on ideation methods such as brainstorming and Random Stimulation. He found through studies (e.g. Bouchard 1969; Diehl and Stoebe 1987, 1991; Weisberg 1992) that these methods did not transform the ill-defined nature of the problem into a defined and channelled process. Goldenberg quoted Tauber (1972), who stated that the search for new ideas lacked synchronization between the two different activities – screening, which is well defined, versus ideation, which tends to be ill defined (Goldenberg et al. 1999). He responded by designing a template modified from Altshuller's method of technological innovation, TRIZ, through backward analysis in order to achieve new products. Brainstorming can use a hands-on approach typically through a facilitator. It also includes the physical action of writing on pads, drawing or other such objects to inspire a free flow of ideas or thought and can also be computer based. Ideation Brainstorming (I-TRIZ) is a product based on Russian Theory of Inventive Problem Solving (TRIZ). It is a 4-step software based problem solving approach. Even though research had shown little benefit from using brainstorming in ideation, it is still used and evidenced in popular culture by Brand Strategy Insider. They claim brainstorming is a key method of ideation and exchanging ideas. Ideation tools can also be used to facilitate thinking techniques. De Bono authors one of the most popular methods for lateral thinking. De Bono describes Parallel Thinking and the 'six hat method' of communicating ideas without attacking each other. This is an excellent approach that is also concerned with communication. It was used by companies such as Motorola and Honeywell. De Bono's 'six hat method' is similar to other lateral thinking methods like the computer based SCAMPER; a computer-based lateral thinking technique that uses directed questions not normally posed in order to come up with new ideas.

Although ideation cannot be observed as the phenomena of thinking, research has been produced based on the design task (Savage and Miles 1998). The research provided information through analogies regarding how the design task reflects and defines design ideation (Dorner 1999; Dahl and Moreau 2002; Ball and Christensen 2009). This method of understanding ideation has developed into various ideation approaches for example Analogical Thinking for new product development as researched by Dahl and Moreau (Dahl and Moreau

2002). Ideation tools like 'Analogical thinking' that is a reassembling of elements from existing knowledge bases in a novel fashion to produce a new idea(Gagne and Shoben 1997; Hampton 1997; Ward 1994; Dahl and Page 2002) and 'Channeled ideation approaches' (Goldenberg et al. 1999) help designers (users) albeit finitely generate ideas in relation to a problem or design requirement. Technology is being used to increase ideation tool efficiency, as a method for generating ideas. The tools range from creative engagement for peer-to-peer networks, knowledge bases for the user only and over all methods to evaluate the process (Fan et al. 2009). Our limited knowledge of cognitive processes is such that the advent of technology can easily deconstruct our current knowledge of cognitive process. It's my opinion that we currently have no mechanisms to understand cognition in toto, therefore to understand cognition objectively with computers without greater effort in accounting for computer based technology is untenable. This shared concern has already spawned research for understanding the creative engagement of users like designers with interactive systems (Bilda and Edmonds 2008). Dorta and Perez have written about a Hybrid Ideation Space that is a technology-based tool for designers to draw sketches that can be shared with the client or collaborators during ideation. This tool is used in order to facilitate ideation over large distances (Dorta and Perez 2009; Dorta and Marinuzzo 2009). While it is a collaborative tool it does not focus on the client and designer, their cultural dynamics or their immediate proximity.

Alongside computer-based lateral thinking tools, mind mapping tools are particularly popular since they can be applied to a group and between a person and the computer as a thinking technique. Mind mapping is a simple technique that is used as a problem-structuring tool to record and arrange ideas in a visual form (Vidal 2006, pp. 1348). There is no general consensus regarding its effectiveness for generating creative ideas. Heisig in 1976, claimed mind-mapping techniques could discourage and underestimate uncharted territory altogether. A more recent study by Kokotovich affirmed Heisig when his research employed a 'non-hierarchical mind mapping technique to guide novice designers in adopting the design problem solving process/framework of expert designers' (Kokotovich 2007, pp. 1). Brainstorming and mind mapping can be conducted without the aide of technology. Technology based ideation tools now include technologically based tools for the ideation tools to help us ideate with them (Davison 2004). Ideation research also utilizes a hands-on approach within design by externalizing mental images through the act of sketching (Ullman et al. 1990; Goldschmidt 1995; Kokotovich and Purcell 2000; Kavakli and Gero 2001; Bilda 2007, pp. 343). This method has moved from traditional sketching with a pen and paper into the digital realm (Jonson 2004 and Stones 2007). Dorta and Perez in recognizing the importance of ideation have developed a hybrid approach where a designer's ideation is augmented by computer/technology. The Hybrid Ideation Space (HIS) was developed with the intention of augmenting analogue tools and, in turn, improving the ideation process (Dorta and Perez 2008, pp. 121). Given the nature of the design process, ideation tools can become a convenient method of reaffirming the role of design as a pragmatic exercise that extends to ideation.

Technology continues to make significant contributions to problem solving and an understanding of creativity through architectural research in particular (Cross et al. 1996). Ernst van Aken, for example, has proposed a

more effective approach to complex architectural and engineering design problems through prescriptive design models which are based on Bunge's technological rule where the approach is 'an instruction to perform a finite number of acts in a given order and with a given aim' (Bunge 1967; p 132; van Aken 2005, pp. 389). The most effective solutions are deduced from that which has been tried and tested. This proposition is similar to those that propose ideation tools as knowledge bases (Ahmed 2005; Dahl and Page 2002). Ideation tools based on this alone given the nature of complexity is problematic as a problem changing over time, it may in fact not look like anything the designer has seen before. It also creates a paradigm where creativity is contextualized and trivialized by prioritizing past established methods of problem solving when the problem is new.

Ideation tool research reflects uncertainty about the role of technology in creativity but this observation does not preclude it's growing and at times dominant influence. Kryssanov and Kitamura proposed creativity through semiotics and computer enhancing design methods. While proposing a technological solution to increase design creativity they also recognize that even if it is sometimes claimed that a particular tool is able to foster and enhance the designer's creativity, it is still unclear what is meant by 'enhancing creativity,' and whether computers can deal with creativity at all' (Kryssanov and Kitamura 2001, pp. 332). Such reflection about the role of technology as a creative agent or catalyst is a minority to the technological trend. Redefining creativity in terms of the design outcome is a more common practice so that the ideation tool is purportedly more functional and efficient. Product, engineering and architectural design provided examples of ideation tools where creativity was defined within the context of designs instead of creativity. Kim, author of Creative Design and Intelligent Tutoring Systems (CREDITS)) has stated that 'creativity has been usually defined as a person's ability to produce a novel and appropriate product (Lubart 1994; Sternberg and Lubart 1996; Amabile 1997; Sternberg 2001)' (Kim et al. 2007, pp. 585). Jin and Chusilp define creativity as a 'process of refining and formulating a problem and ideas for a solution, with constant iteration of analysis, synthesis and evaluation processes between problem-space and solution space' (Jin and Chusilp 2006, pp. 27) which is at odds with a function of ideation where ideas are explored. Within these definitions of creativity tools like Limited Commitment Mode, a control strategy, have emerged. It is an example of using computer-aided technology to formulate creative approaches and optimize pragmatic outcomes based on the design parameters (Kim et al. 2007, pp. 586). Kim has observed and quoted (Finke et al. 1992) that more original solutions were generated under conditions of strong constraints…'(Kim et al. 2007, pp. 586). CREDITS and Limited Commitment Mode provides a counter argument to more open and creative ideation techniques. Examples of creativity presented within this limited scope of purpose are not unusual within product design and development (Montgomery 1999; Shah and Vargas-Hernandez 2007; Savage and Miles 1998).

Emerging technological innovation has inherent challenges like contributing to Schumpeter 'creative destruction' (Kash 2002, pp. 581). Kryssanov and Kitamura propose creativity through semiotics and computer enhancing methods while they recognize that the 'creative process is (at least in part) unconscious and that thought is impossible to observe and difficult to explain. Even if it is sometimes claimed that a particular tool is

able to foster and enhance the designer's creativity, it is still unclear what is meant by 'enhancing creativity,' and whether computers can deal with creativity at all' (Kryssanov and Kitamura 2001, pp. 332). This research does not extend into defining how creativity is enhanced, in whatever capacity that is meant. Methods of assessing and measuring are somewhat arbitrary since creativity is still difficult to relate the occurrence of cognitive process to idea generation methods. Kryssanov and Kitamura raise an important question regarding how we define creativity and how that definition is satisfied through technology. Nigel Cross has written an article related to the topic of creativity and technology, 'Can a Machine Design?' His article does more to expand the relationship between computers (CAD for example) and how we define designing and what we consider uniquely human and artificial. Other technology-based methods of developing ideas have emerged, focusing less on purpose and goals and more on the process of developing ideas. Goldschmidt and Tatsa have designed Linkography. Linkography is a way of tracing ideas within a studio to see how ideas develop within collaborative relationships. Goldschmidt and Tatsa's work with Linkography prioritizes the journey of developing ideas through collaboration and gives it more consideration than the outcome. They have defined creativity in terms of 'the capacity to produce new or original ideas' (e.g., Guildford 1950; Vernon 1989; Eysenck 1994) (Goldschmidt and Tatsa 2006, pp. 593). Their research and Linkography have been cited in recent ideation and creativity papers (Stones 2007; Kim 2008; Bilda 2007; Kan and Gero 2008). Lai and Chang have provided similar research combining linking systems with idea conception in the ideation phase. Our research approaches are similar in that we are both poised to generate ideas between two or more participants. Lai and Chang use the Dynamic Agent Role Interplay System (DARIS) and Dynamic Idea Maps II (DIM-2). DARIS is a computer-based program that takes distributed interactions, computes them and then evaluates them. DIM-II is a distributed linking system used to support the idea association and distributed collaboration environment. Linkography and Lai and Chang provide support within the design studio and facilitate idea generation, but neither tool specifically addresses communication as a method of generating design possibilities. As a result, Linkography is not specifically designed to incorporate the client within the ideation phase and Lai and Chang aren't pursuing creativity but technology based idea association.

Environments that undermine intrinsic motivation by imposing deadlines, surveillance, or the expectation of evaluation, result in less creative products than environments that enhance intrinsic motivation (though, cf., Eisenberger & Cameron, 1996) (King 2007, pp. 2). Bohm cautions us in stating 'when creativity is transformed into accomplish a useful purpose, or goal, we will have an assumption behind it as to what is useful, and that assumption is going to limit us' (Bohm 2007, pp. 20). When the purpose becomes an incentive or the goal for being creative especially when purposefulness is at odds with creativity. The danger in this thinking is that the process can become quite finite and we lose sight of the journey and the process, which is the point I believe Bohm alludes to. Achieving an environment within the design process between the major stakeholders will need to become a priority if we are to acknowledge the complex cultural and economic context in which design ideation is currently situated.

The pragmatic role of ideation tools for probabilistic or predictable creativity is contrary to cognitive research in creativity and idea generation. Ideation tools do however support a perception that economic goals and productivity are singularly attainable.

The review of ideation tools has put into context the confining and at times contradictory definitions of creativity that ideation tools are based on. What has emerged is that design outcomes and efficient design processes influence ideation tool design more than the cognitive interactions between the ideation tool and user. Ideation tools are not designed to consistently provide a bridge between ideas, cognition and design or to perform outside the context of design. They are designed and defined within a narrow context to generate efficient design outcomes. Ideation research can result in tools that are an embodiment of their cognitive definitions therefore to step outside of the ideation tool is to step outside of it's function. It is as though we apply two distinct categories of cognition one for cognitive research and the other for ideation tools. This occurs even though the creative process not pragmatic process result in ideas. A conflict between the creative and design process is that unconstrained creativity may produce ideas different from the proposed solution in the design brief. My academic experience as an undergraduate graphic designer was riddled with these impasses because the curriculum was more closely aligned with industry expectations than with collaboration. Brand Insider has described the goal of an ideation phase to generate as many ideas as possible in the most condensed timeframe (Brand Insider 2006, pp. 1). Cognition research in contrast recognizes the innate difficulty of communicating creativity and the unpredictability of changing states for emergent and novel ideas. It reflects a need for less focus, more time and greater consideration.

Cognitive research is an emergent and expansive area where creativity exists and free thinking occurs. It is also an area where the definitions of creativity and cognition lack consensus. While ideation research can treat cognition and creativity as privileged knowledge like 'designerly ways of knowing', design practice unfortunately can reduce them to pragmatic or strategic problem solving. These targeted methods are known within creative and cognitive research to fail. They fail because they assume the segmentation of creativity as a separate cognitive function and as a result restrict ideation. They are also recognized as less effective ideation tools because the designer lacks a level of engagement with the complexity of the problem to provide solutions. A reason for this, as it relates to design, is that the relationship between creative ideas or innovation and economy are codependent and interdependent. The creative ideas are both the curse and the cure. Technology was introduced in the prior section as a tool and method of ideation albeit creatively limited. In this case technology integrates a rationalization of the ends as a means. Davison elaborates by pointing out the role technology plays by disassociating an existential practice. This occurs as a disassociation between the freedoms of individual self-creation through consumption and the ‘background of means’ that sustains this world of private choice. Technology facilitates the choices, if they are in fact choices. We are unknowingly dependent and inter dependent on technology in areas such as food, shelter and environment. I believe like Davison that we are unaware about how it affects our very thoughts and knowledge of ourselves. It's as though we cannot recognize

if lines exist between technology and ourselves (Davison 2004, pp. 86).

As a possible response to the role of technology Victor Margolin has advocated for design's larger role in society. Doloughan has noted that our ways of thinking about and attitudes towards language and the acquisition of knowledge remained defiantly rooted in notions of realism, empiricism, and a belief in the scientific method' (Doloughan 2002, pp. 57). Technology is a trusted method and as such, I believe this explains some of the tensions between cognitive research and it's application for designing ideation tools. As it's been mentioned in the contemporary views of ideation, there is a growing awareness that the world is not as orderly as we would like to believe. I am not sure if this will extend to a more critical critique of our relationship with technology but I don't see these conflicts being fully addressed in the near future. A major paradigm shift for technological criticism cannot come soon enough.

Maturana and Varela provide a foundation that cognition, a biological phenomenon, guides our handling of the universe and that knowledge gives certainty to our acts (Maturana and Varela 1980, pp. 5). Ideation and cognition have irreducible characteristics. They cannot be separated into one process, but they encompass visual and linguistic functions as a part of cognition (Bronowski 1978[xxiii]; Gurwitsch 1949; Percy 1956; Maturana and Varela 1980; Harris 2001). Cognition as a biological phenomenon is a human characteristic that describes our cognitive capacity to generate ideas. As a process that happens in the head there is a danger in observing and defining ideation based on a design activity. This is because ideation occurs as a function of cognition that is not exclusive to the design activity. If we agree that ideation is a cognitive human function that is not dependent on the design activity as it has been defined then how do we definitively or significantly differentiate types of ideation? Differentiating types of ideation is akin to defining artistic and scientific thinking. I believe this places arbitrary labels on a process that is more holistic than either definition implies. This research aims not to discriminate, produce or contribute to hierarchical definitions of perceived differences in ideation. It strives instead to recognize as Husserl, Gelb and Goldstein have done to support and develop theories that converge towards recognizing ideation as an act 'sui generis' with a specific nature of its own (Gurwitsch 1949, pp. 187). Gelb and Goldstein's research also extends to cognitive activity and innovation with in organizations (Bertola and Tiexiera, 2003). Like Sheldrake's morphic resonance that deals with a larger group dynamic, innovation within organizations is beyond this research. Design knowledge and design ideation are researched extensively in the domain of design such that little attention is given to facilitating ideation between the client and designer. In response to this I would suggest observing ideation in different contexts so that a more general design ideation theory can be formulated. This would bring science, business, education and any other field or like activity that involves ideation into the area of study and research.

Butler, Egeth et al., Engel, Fernyhough, Glanville, Maturana and Varela, Vygotsky and West contribute a broad cognitive understanding that creativity, ideation and language do not occur in isolation. This is important because what we think may not be what we say. Beardslee states that language is, by itself, thoroughly indeterminate but, given a context, a history and a trajectory can become an instrument of contact with reality, however fallible' (Beardslee 1979, pp. 33). Since there are no direct translations of the images or thoughts that

we can convey without misrepresentation it is important to recognize the work of Foucault, Sapir and Whorf, Vygotsky, Wittgenstein and Harnack within the field of cognition and linguistics. They clarify obstacles of communicating ideas during ideation. Sapir and Whorf hypothesis for example states that language has the ability to shape and form one's own reality and that language is the means to understand the psychic function of thinking (Grieffenhagen and Sharrock 2007; Lucy 1997; Subbiondo 2005, pp. 153). Language as a part of cognitive function in the design process can serve to orient the client and designer. Maturana and Varela describe linguistic behavior as an orientating behavior so that the orientee can be oriented within the cognitive domain that is independent of the nature of the orientating interactions. Orientation as Maturana and Varela state, 'strongly increases the cooperation between social animals' (Maturana and Varela 1980, pp. 31). Orientation benefits ideation as a cooperative method that we are able to access with no biological exclusion. This type of orientation can occur through dialogue. Scott defines dialogue as 'a disciplined approach to a higher level of communication that generates a previously unrealized understanding, insight, or truth. Dialogue requires participants to observe their thoughts, including reactions, perceptions, and ideas. They are meant to suspend any judgments or biases that might influence their ability to understand and connect with other members of the group' (Trent 2006, pp. 5). Design dialog influenced different design approaches including mine. Yap (2003) for example describes the work of Nonaka and Tkeuchi. Their findings substantiate that new product development rests heavily on the creative process but that the sharing and articulation is a key point. Gleitman and Li have reported that communication during the creative process can be as detrimental to spacial reasoning as it as seen as an integral part of the new product development (Gleitman and Li, 2002 pp. 267). This is exemplified in part by Matthews (2007) and Dutton (1987). Matthews has provided research including reference to Bowers and Pycock's analysis of designer-user dialog in the co-construction of 'design requirements' (Matthews 2007). Dutton describes the existing hierarchical structures of dialog within the architectural design studio and education. He states that true dialog which can only occur among equals rarely occurs. Dutton states that within hierarchal establishments like schools and design studios by definition cannot have dialog. He reasons that a precondition dialog requires an equality of participants-an equal distribution of power-which by definition is lacking in any system of hierarchy (Dutton 1987, pp. 18). His argument in my opinion is too often overlooked but absolutely correct.

Education and industry provide little consensus regarding the cognitive functions of creativity. Education devises methods to develop creative individuals from child to adult. The methods can contradict what we know about creativity. Bohm describes how creativity changes in a child who is playful into the adult who may take a more mechanistic approach. He surmises that learning becomes more narrow and that it occurs through repetition in academia to pass exams. This in turn as time goes on results in the adults' ability to see something new gradually die away (Bohm 2007, pp. 4). The change we experience going from free play to a false play is characterized by Engel. He describes how the initial development of a baby who's world is a global experience transforms to the baby that develops distinctions between what is real and what is imagined, and what is playful and what is pragmatic. This transformation occurs when the boundaries between these types of experience

become firmer (Engel 2005, pp. 517). McLaren and Stables provide an account of learner and teacher perceptions of what it means to be creative. This includes comments from learners describing creativity as 'crazy ideas' or 'making things' while teachers commented that it was 'problem solving'. Both of them saw creativity as having a relationship with 'better ideas.' At this point we can start to distinguish between the teacher seeing 'better ideas' as solving problems vs. the student's conception of 'crazy ideas' and 'making things'. The design process suffers as the learners comment that they are 'jumping through hoops' and being advised to a formulaic approach to designing and playing it safe. The design process and creativity should not be two separate entities but an activity reflecting that 'learners and teachers agree that being allowed to be creative is more fun' (McLaren and Stables 2007, pp. 9). Freedman and Relan have offered arguments based their research with children and university students using computer based paint systems can begin to focus less on the technology and more on ideas (Freedman and Relan 1992, pp. 108). Although they considered the outcomes successful, there are questions regarding how traditional methods involving mechanical and exploration compared with the computer. My main concern is that the software which is not affected by the child or students desire to change it is more of a test of their ability to adapt to it. Why would students or children be forced into adapting to this one method when an integration with traditional methods offers more avenues for creativity? There is little that can be compared between this process and the process of exploration with art materials other than the development and learning needed to command either approach. The impact of education upon the design profession becomes clearer through Mykheeva's argument regarding education's role in providing society with creative people. The aim of education (as an end result of which an individual should be "educated") is not to accumulate knowledge, but rather to shape consciousness, to encourage a child's ability to think independently, to work in a creative manner. If we want our ideas about education to prevail, then society should begin to concern itself with people who are creative. Presently the value of knowledge lies in its practicality, in its actual results, in the "utility" that results from creativity. In fact the value of a creative personality really lies in the personality itself' (Mykheeva, et al. 1991, pp. 49). Design education has been transformed from Albers and Maholy-Nagy's emphasis to improvise or 'rig up' something and subsequent approaches developed by Friedrich Froebel's pedagogy of 'education through play' (Behrens 1998, pp. 300) into systematic design approaches characterized by 'jumping through hoops'. Creativity within the design process should 'break rules', access random and chaotic behaviour, and designers should have fun.

In contrast to a creative design process, a pragmatic or industry lead creative design approach is more common. Pragmatic cognitive approaches like cybernetics as a natural extension of creativity, control, communication, and probability, is written about extensively. Negley wrote about theories of the mind (1976), There is a wealth of information relating cybernetics, communication and creativity including Apter wrote about cybernetics as a method of understanding creativity (Apter, 1969), Glanville wrote about cybernetics and communication (Glanville, 1996), Godwin wrote about spatial paradigms for creative transitions (Godwin, 1997), Loeb wrote about cybernetics and artistic methods (Loeb, 1991), Macy and Lazlo wrote about cybernetics and Buddhism (Macy and Lazlo, 1976). I am still concerned about the role of intentions in the creative process. While

cybernetics can be traced to the Bauhaus, philosophically cybernetics as a method of communication and control can be at odds with creative ideation. A comment by Eckersley regarding what design is can be alarming because he describes the design process as a cybernetic machine in which the rules define the capabilities of the machine, randomness provides the input, and the design product is the output. if we are considering design as a source of creative ideas. It is as though he envisions the role of the designer to be more computer like while ignoring the unique qualities that make a designer indispensable (Eckersley 1990, pp. 78). I would argue that being creative is not limited to what he states as the designer's role in manipulating or redesigning a machine to get more satisfactory designs that adhere to the rules of the machine.
The potential implications of improving methods of communication and improving our understanding of creativity through cybernetics could become influential in its own right (Apter 1969, pp. 262). Cybernetics none-the-less is not a substitute for creativity. Unfortunately, the 'essence of humanity" in the technocratic age has been replaced by the concern for getting things done," and where the individual has become only a means for realizing this goal (Mykheeva et al. 1991, pp. 44). Creativity could encourage a new kind of thinking, getting rid of the desire to control and be controlled (Jonas 2001). A cybernetic approach based on physical process with physical methods that focuses on validating an ideation approach through physical results may be inadequate, counter productive and unhelpful (Deutsch 1951, pp. 193, 196).

Ideation research has adopted probabilities for new product development (architectural and product). The adoption of probabilities, creativity and control are written about extensively in tandem with cybernetics (Apter 1969; Deutsch 1951; Eckersley 1990; Godwin et al. 1997; Kristeller 1983; Loeb 1991; Morhfeld 1974 and Simon 1996). Briggs and Reinig define ideation as the process of generating or conceiving of ideas and concepts that may be useful for attaining some desired state or outcome, where 'the ultimate purpose of ideation is to produce good ideas' (Briggs and Reinig 2007, pp. 1).

Many ideation tools are designed with this pragmatic approach in mind. Bounded Ideation for example was developed through the recognition that more ideas could have a connection to better ideas. Bounded ideation may useful as an incremental ideation where the designer builds on a design or finds differences between designs. There are however documented drawbacks as it relates to a designer's ideation and creativity. Bounded ideation in addition to other incremental ideation tools could exacerbate the weaknesses in the designer's mental habits. During these initial conceptual stages, it has been shown that designers are particularly susceptible to information from example solutions such as existing products that are similar to what is being designed (Jansson and Smith, 1991; Purcell and Gero, 1996; Chrysalis and Weisberg 2005; Perttula and Liikkanen 2006). Designers have even been observed to incorporate poor aspects of existing solutions into their design (Jansson and Smith, 1991). One possible explanation for this is that designers become fixated on existing designs to the extent that they are not able to think of any other ways to solve the current problem. As a possible response Donella Meadows has focused on key points affecting the rest of the process. Meadows states that there are 'leverage points' in systems and by accessing these points with a small change, the over all process

reflects a larger shift. Meadows states that leverage points' are not fixed in time, they are more indicative of processes or operations. Little research, however, has examined the influence of the cognitive strategies used by the product developers on the quality of the concepts produced in these stages. Two more recent articles on product ideation and design are exceptions (Dahl, Chattopadhyay, and Gorn 1999; Goldenberg, Mazursky and Solomon 1999). Although these studies have proposed better methods for product design and development, their contributions are limited primarily to straightforward design tasks such as product redesign and the development of incremental innovations (Dahl and Moreau 2002, pp. 47).

Feldman and Lecusay developed ideation theories of cognition for the realm of culture and artefacts. This is easily relatable to the function of the designer as maker. Cognitive investigations extend to idea generation. Shah developed various controlled cognitive models of creativity based on prior research (Shah et al., 2000; Koestler 1964...). They used very simple tasks or problems but they have not extended to design problems that are much more complex (Shah et al., 2003 pp. 2). Savage and Miles have written a paper further substantiating Shah in the assertion that there is a great demand for novel solutions and a lack of understanding of creativity in design, the most cognitively demanding activities undertaken (Savage and Miles, 1998). Clipson states that there is in architecture an Alice-in-Wonderland situation of either giving answers to questions no one is asking or ignoring completely some of the more pressing and obvious problems. Symptoms like poor communication and the isolation of the designer from the process and the client are quite clear (Clipson, 1992 pp. 218-219).

The biological phenomena of cognition and ideation are formulated within the context that 'design is goal oriented' (Shah 2003). While these findings may be useful in routine design scenarios when similar products already exist, complex design problems seldom come with example solutions or the right answer. Owen is quite clear when he states that the stakes are now too high for critical information to be unheard or ignored. In a world with growing problems that desperately need understanding and insight, there is also a great need for ideas that can blend that understanding and insight in creative new solutions (Owen 2006). The condition is made worse because designers often subconsciously look to other devices that they have encountered or may encounter while working on the problem (Tseng et al. 2008, pp. 1-2). Apart from the designer's issues, they are also working in a world whereas Trent stated most people live by their opinions and ideas, beliefs and values without consideration or contemplation. The are blindly marching ahead through life, believing a mere idea or opinion is reality and acting from this place. The result is that many people, countries, and nations will never connect because of ingrained beliefs that form insurmountable walls and impenetrable realities (Trent 2006, pp. 5). Creative or novel solutions could be more effective if we change the way we envision economy and its interaction with the design and cognitive environment. It may not necessarily lead to one fixed goal, nor does it have to approximate any such goal more closely (Mayr 1992, pp. 191). I believe Yap describes a better ideation situation where it as a place where fragmented thoughts and ideas bloom in the mind of designers/engineers in their initial effort to concretize the vision (Yap et al. 2003, pp. 90). The pragmatic notion is still in his words of concretize, but dialogue can realize emergence like 'ideas blooming'. I would like to see the ideation phase can

become a field of research for envisioning, emergent and collaborative activity out of necessity. The contrast between cognitive and ideation research is not only the recognition of tools like dialogue but also the limitations that design and other fields impose on the process.

A survey of ideation tools for collaborative and creative catalyzation reveals a gap for client and designer collaborative tools to engage complex design problems.

The development of ideation tools have taken on a life of their own without many tools drawing comparisons, but drawing on themselves and validating their methods with their own outcomes. A survey of the ideation tools exposes an area of study that gets little attention. This list represents a general survey of collaboration and ideation tools. There are many other tools, but this one has provided balance of fields, depth and detail. This area is where complex design problems, creative collaboration and client led idea generation tools meet. The following criteria where combined to give a better picture of the researches concern where face-to-face collaborative tools for the client and the designer where in the context of other tools. Ross and Shah have collated lists and criteria for categorizing them. I have used Shah and Smith because they provide a less cognitively biased account where Ross provides his own vocabulary for his own ideation tool inventive ideation (Shah and Smith 2003; Ross 2006).

Menu of columns

1. Name of ideation tool – Represents the name of which it was discovered as, but it could have other/more names or be derived from another tool. If it another name is known it was put in the notes.
2. Market segment – The market in which the ideation tool was made/designed for. Typically market segments include design (engineering, graphic, architectural and product), industrial, general (school, government, general business practice or generic)
3. Collaborative (internal/external) – Is it a collaborative tool that is used within teams (internal) or used (external) between internal and external clients
4. Computer or software based – The ideation tool was designed for the user to use on a computer or other electronic device either as an interface or source of information.
5. Categories and subcategories of ideation tools (Shan and Hernandez-Vargas 2003)
    a) Intuitive – Using mechanisms to break up what is believed to be mental blocks
        i. Germinal – Aim to produce ideas from scratch
        ii. Transformational – Generate ideas by moulding existing ones
        iii. Progressive – Generate ideas by repeating the same steps many times, generating ideas in discrete progressive steps
        iv. Organizational – Help designers group generate ideas in some meaningful way
        v. Hybrid – Combines different techniques to address different varying needs at different phases of ideation
    b) Logical
        i. History based - Use past solutions catalogued in some form of database.
        ii. Analytical – Develop ideas from first principles by systematically analysing basic relations,

casual chains and desirable/undesirable outcomes

c) Analogy – Generating ideas based on a comparison between two things, typically on the basis of their structure and for the purpose of explanation or clarification.
d) Incremental – Step wise increase or change to an existing design.

The appendix gives the following details:

e) Author – Author of the tool, if known.
f) Source – Either the author of literary source.
g) Notes – Additional information regarding where the information was derived from e.g. website.

Ideation tool summary

Name of ideation tool	Market segment	Context	Collaborative (internal/external)	Computer based	Germinal (aim to produce ideas from scratch)	Transformational/ incremental (generate ideas by modifying existing ones)	Progressive (generate ideas by repeating the same steps many times, generating ideas in discrete progressive steps)	Organizational (help designers group generate ideas in some meaningful way)
A channeled ideation approach	New product development and marketing	New product ideation might be improved by identifying and applying certain well-defined schemes derived from an historical analysis of product-based trends, termed "templates."These templates might con-tribute to the understanding and prediction of new product emergence.		x				
Adobe Photoshop CS3	Engineering design	early concept generation and communication medium for clients	external	x				x
Analogies	General	a comparison between two things, typically on the basis of their structure and for the purpose of explanation or clarification	internal	x				
Attribute analogy chains	General	Structured mapping technique that select for dynamic causal knowledge, or more generally, for appropriate abstractions	internal					
Attribute listing	General	A techniques for finding new combinations of products or services. Focuses on the attributes of an object, seeing how each attribute could be improved.		x				
Axon Idea Processor		provides an environment that supports the thinking processes. It helps you to create, communicate, explore, plan, draw, compose, design and learn.	internal	x				
bisociation	General	Koestler's basic idea is that the creative act is a "bisociation" (not mere association) which happens, if two (or more) apparently incompatible frames of thought ("matrices") are brought together by an				x		
BrainBox	Research, training and marketing	Brainbox is a team of research experts who work with you to improve the way your business and services work. We conduct research and apply the latest knowledge to help you answer your business questions, and improve the experience of your customers or service users.	external		x	x		
Brainstorming	General	Generation of many ideas within a group	internal	x	x			
C-Sketch	Engineering design	In the C-Sketch method, designers work on developing graphical representations of solutions to a design problem. The method is suitable for use after the problem definition and clarification stage in the engineering design process. Designers work independently, developing a sketch of their proposed solution to the problem for a predetermined length of time (cycle-time). At the end of each cycle, the sketch is passed to the next designer. This designer may then add, modify, or delete aspects of the design solution.	internal		x	x	x	x

Ideation tool summary

Name of ideation tool	Hybrid (combines different techniques to address varying needs at different phases of ideation)	History based - use past solutions catalogued in some form of database.	Analytical (develop ideas from first principles by systematically analysing basic relations, casual chains, and desirable/undesirable attributes	Analogy	Designed to address complex design problems	Designed for client and designer collaboration
A channeled ideation approach		x				
Adobe Photoshop CS3	x		x			x
Analogies				x		
Attribute analogy chains					x	
Attribute listing						
Axon Idea Processor						
bisociation				x		
BrainBox	x		x			
Brainstorming				x	x	
C-Sketch					x	

Ideation tool summary

Name of ideation tool	Market segment	Context	Collaborative (internal/external)	Computer based	Germinal (aim to produce ideas from scratch)	Transformational/ incremental (generate ideas by modifying existing ones)	Progressive (generate ideas by repeating the same steps many times, generating ideas in discrete progressive steps)	Organizational (help designers group generate ideas in some meaningful way)
Channeled ideation approach	Design	Templates used to improve new product ideation by identifying and applying well-defined schemes derived from historical analysis of product trends to predict new product emergences.		x	x			
Checklists	General	The Osborn's checklist is a guide/tool to facilitate the generation of concepts. The checklist is composed of questions. These queries are to be used to catalyze the concept generation and to widen the scope.						
Client show	Design	ClientShow is a real-time collaboration and digital asset management service developed specifically for creative agencies, their teams and clients. As a SaaS platform, ClientShow allows creative agencies to standardize their interaction and approval process, which is an affordable alternative to building an expensive, customized solution	external		x			
Collaborative design framework within peer-to-peer networks	Mechanical engineering	Current grid applications mainly based on client–server architecture are inflexible and rigid for fast changing collaborations among manufacturers, especially for small and medium enterprises. In this paper, a distributed collaborative design framework is presented with a hybrid of grid and peer-to-peer technology. In order to access computational resources for design, analysis and process simulation, a meta-scheduler is designed and implemented. It helps in resource discovery and optimal utilization of resources. A test bed is established, based on the framework proposed to demonstrate a distributed collaborative design and manufacturing environment.			x			
Computer aided creative product design platform (CAD)	Architecture and design	drawing tool that helps conceptualization of the design		**x**	**x**			**x**
CREDO	Engineering design	a conceptual design process in which 12 design transmutations are used for the generation of design concepts.		**x**	**x**			
Decision Lab – Preference Organisation MeTHod for Enrichment (PROMETHEE)	Multicriteria analysis for project and policy evaluation	Design and of the decision-making hierarchy and the determination of weights		**x**				
Design for manufacturing (DFM)	Management science	Including the value of time in design-for-manufacturing decision making; to make product easy to manufacture during the design phase of the development process		**x**				**x**

Ideation tool summary

Name of ideation tool	Hybrid (combines different techniques to address varying needs at different phases of ideation)	History based - use past solutions catalogued in some form of database.	Analytical (develop ideas from first principles by systematically analysing basic relations, casual chains, and desirable/undesirable attributes	Analogy	Designed to address complex design problems	Designed for client and designer collaboration
Channeled ideation approach		x				
Checklists			x			
Client show						
Collaborative design framework within peer-to-peer networks						
Computer aided creative product design platform (CAD)		x				
CREDO			x			
Decision Lab – Preference Organisation MeTHod for Enrichment (PROMETHEE)		x				
Design for manufacturing (DFM)						

Ideation tool summary

Name of ideation tool	Market segment	Context	Collaborative (internal/external)	Computer based	Germinal (aim to produce ideas from scratch)	Transformational/ incremental (generate ideas by modifying existing ones)	Progressive (generate ideas by repeating the same steps many times, generating ideas in discrete progressive steps)	Organizational (help designers group generate ideas in some meaningful way)
Design Space Frame (DSF) for Human centred design (HCD	Product design	Design Contribution Square (DCS), to organize HCD approaches and assist in identifying their characteristics. Generally, the DCS is a framework for mapping HCD practices and methods based on the amount of proactive initiative users and/or designers show in design collaboration. The author claims that a mapping based on the participants' initiative is capable of explicating essential differences between HCD approaches. Therefore, it can be a feasible tool for planning HCD projects and competence development with human centered approaches.			x			x
Digital sketching and sketching	Design	sketching as an ideation tool to aid the design process		**x**	**x**			
Dimensional reduction	Researchers working in domains as diverse as engineering, astronomy, biology, remote sensing, economics, and consumer transactions.	The process of reducing the number of random variables under consideration, and can be divided into feature selection and feature extraction		**x**				
Distributed linking system	Design	Design is an interactive endeavor involving the evoloution of ideas between two or more participants in a discussion, especially during the conceptual design stage. Dynamic Agent Role Interplay System (DARIS), some computational components within the distributed interactions are computed and evaluated. Finally, a distributed linking model named Dynamic Idea Maps II (DIM-2) is computerized to support the idea association in a distributed collaboration environment.(Lai et al., 2006 pp. 685)			x			
EiDOS	Business and education	Collaborative ideation tool that allows the designer to guide the client through complex design problems with the goal of increasing the amount of possibilities	**external**		**x**	**x**		**x**
Engagement model – Human computer interaction (HCI)	Interactive art and design	facilitate communication between artist, interaction designers, researchers and system developers to improve collaboration and stimulating new artifact design	**internal**	**x**	**x**			**x**
Excursion techniques	General	The Excursion technique was invented by Synectics in the early 1960's. It is applied when a group needs a creative boost. One of the most effective excursions is the Example Excursion, in which the group lists examples from a different "world" than the one under discussion yet that have a similar dynamic or nature.	**internal**			**x**		**x**

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Design Space Frame (DSF) for Human centred design (HCD						
Digital sketching and sketching					x	
Dimensional reduction			x		x	
Distributed linking system						x
EiDOS	x			x	x	x
Engagement model – Human computer interaction (HCI)			x			x
Excursion techniques				x		

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Experience definition through Storyboarding	User experience design	The “Experience Definition through Storyboarding” studio will offer participants the opportunity to design compelling experiences from a user/audience perspective, using the storyboarding process as the primary ideation tool.			x			
Expert choice – Analytic hierarchy process (AHP)	Multicriteria analysis for project and policy evaluation	Design and of the decision-making hierarchy and the determination of weights		**x**		**x**		
Fishbone Diagrams	Design	It's a cause-and-effect diagrams that show the causes of a certain event. Common uses of the Ishikawa diagram are product design and quality defect prevention, to identify potential factors causing an overall effect.		**x**				**x**
Forced connections/relationships	General	Forcing an association between the problem or solution and random words						
Forward Steps	General	The user analyses variations of initial solutions.				**x**		
Free (word) association		a common word game involving an exchange of words that are associated together. The game is based on the noun phrase word association, meaning "stimulation of an associative pattern by a word"[1] or "the connection and production of other words in response to a given word, done spontaneously as a game, creative technique, or in a psychiatric evaluation."	**internal**	**x**				
Gallery method	General	The Gallery method is a mixture of physical and mental activity whilst generating ideas. The participants move past the ideas (as in an art gallery) rather than the ideas moving past the participants (as in the Pin-Card Technique).			**x**		**x**	
Generative tools	Product and services design, marketing	User experience design, function-centred design, cultural probes		**x**	**x**	**x**		
Genetic algorithms (GA)	New product development	Generic algorithmic substitution for human creativity		**x**				
Holistic product model (RCR)	Resources, conservation and recycling	a novel approach in taking a holistic view of industrial products and building a formal product models capable of integrating data in a wider perspective		**x**		**x**		**x**
homospatial thinking	General	consists of actively conceiving two or more discrete entities occupying the same space, a conception leading to the articulation of new identities.				**x**		
Hybrid Ideation Space (HIS)	Design	The HIS adds to traditional sketch and models the advantages of a virtual environment, which provides a sense of immersion and presence.augmenting analog tools and, in turn, improving the ideation process		**x**	**x**			
Hypnogogic imagery	General	Transition to and from sleep may be attended by a wide variety of sensory experiences. These can occur in any modality, individually or combined, and range from the vague and barely perceptible to vivid hallucinations.						

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Experience definition through Storyboarding						
Expert choice – Analytic hierarchy process (AHP)		x				
Fishbone Diagrams		x				
Forced connections/relationships						
Forward Steps		x				
Free (word) association				x		
Gallery method						
Generative tools			x	x		
Genetic algorithms (GA)			x			
Holistic product model (RCR)						
homospatial thinking				x		x
Hybrid Ideation Space (HIS)				x		
Hypnogogic imagery						

Ideation tool summary

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Idea Fisher Pro	Business	How to land that big idea and other secrets of creativity in business based on brainstorming			x			
Infused design (ID) (based on Creative conceptual design, CCD)	Computer aided conceptual design tool	method of infused design for product design that determines the principles that govern a product		x				
Innovation Benchwork System	Engineering design	The innovation benchwork system user guide and e learning. A total innovation system that provides engineers with expert I-TRIZ assistance in solving challenging technological problems. Proven to help users develop implementable solutions that at times represent true technological breakthroughs.		x				
Interaction systems design	Architecture and design	To provide and environment for and to stimulate thinking			x	x		
Inventive ideation	General	10 generic thinking strategies or mechanisms that are integrated into a model of inventive ideation which can be used to guide creative thinking in a systematic manner						
K-J method	General	similar to mind-mapping, except it uses nested clusters rather than a tree structure and can be used to build up a problem-solving method through repetition.		x	x	x	x	
Leverage points	Design	These are places within complex systems (a corporation, an economy, a living body, a city, an ecosystem) where a small shift in one thing can produce big changes in everything						
Limited Commitment Mode (LCM)	General	Design creativity can be enhanced by identifying the underlying cognitive capabilities used by expert designers and training novice designers for those capabilities specifically. It has been identified by Goel that designers use the Limited Commitment Mode (LCM) control strategy in design problem solving.		x				
Linkography	General	Linkography is a system of notation and analysis of design processes that focuses on links among design moves (or design ideas, or decisions), developed by e.g., Goldschmidt (1990, 2003) and extended by others (van der Lugt, 2001). Moves are small steps that transform the state of the design search, and we attain them by parsing a protocol of a design session into a sequence of short verbalizations.		x				
Linkography in protocol analysis(measurements using Shannon's entropy)	Design	the development of quantitative methods to compare cognitive aspects of team designing processes		x				

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Idea Fisher Pro						
Infused design (ID) (based on Creative conceptual design, CCD)		x	x			
Innovation Benchwork System						
Interaction systems design	x					
Inventive ideation						
K-J method						
Leverage points					x	
Limited Commitment Mode (LCM)						
Linkography			x			
Linkography in protocol analysis(measurements using Shannon's entropy)	x		x			

Ideation tool summary

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Mapping Network Consciousness:	Design	Instead of building upon existing approaches to 'sustainable design' we sought a new ecological paradigm that would require designers to realise the potential of	internal			x		
Matrix method	General	To generate solutions using the Exploring Innovation Style. It is simply a higher level version of Morphological synthesis, having the same structure and involving the same mechanisms but tailored to the task of understanding a company's business		**x**				
Method 635	Marketing, advertising, design and product development	A group creativity technique based on the concept of Brainstorming, the aim of 6-3-5 Brainwriting is to generate 108 new ideas in half an hour. In a similar way to brainstorming, it is not the quality of ideas that matters but the quantity.	**internal**		**x**		**x**	
Mind-mapping		method for organizing and facilitating the generation of ideas through the approach of categorization	**internal**	**x**		**x**		
Mindlink Problem Solver	General	creative guide and reference manual		**x**				
Modularity	Product architecture	They are using existing modularity methods and a novel redesign effort complexity matrix that Helps define module boundaries so that changes in the modules require minimum design effort.		**x**		**x**		
Morphological analysis	General	As a problem-structuring and problem-solving technique, morphological analysis was designed for multi-dimensional, non-quantifiable problems where causal modelling and simulation do not function well or at all.		**x**	**x**			
Non-hierarchical mind mapping	Design	A tool to guide novice design students in adopting the design problem-solving process/framework of expert designers		**x**				
Osborne's checklist/SCAMPER	General	a computer-based lateral thinking technique that uses directed questions not normally posed in order to come up with new ideas.		**x**				
Parameter based design structure matrix	Architecture and design	This paper introduces the use of parameter-based design structure matrix as a process modelling and system analysis tool for building design.		x				
PCA-frame	Engineering design	structured software for reinforced concrete structures		**x**				
PMI method	General	PMI stands for 'Plus/Minus/Interesting'. In the column underneath 'Plus', write down all the positive results of taking the action. Underneath 'Minus' write down all the negative effects. In the 'Interesting' column write down the implications and possible outcomes of taking the action, whether positive, negative, or uncertain.		**x**		**x**		

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Mapping Network Consciousness:	x					
Matrix method						
Method 635				x		
Mind-mapping						
Mindlink Problem Solver						
Modularity			x		x	
Morphological analysis						
Non-hierarchical mind mapping			x			
Osborne's checklist/SCAMPER						
Parameter based design structure matrix		x	x			
PCA-frame						
PMI method						

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Quality Function Deployment (QDF)	General	originated as an approach aimed at satisfying the users through the provision of high quality products that fit the users' requirements. The approach involves collecting user demands and converting them into deign targets and major quality assurance points to be used throughout the development phase.		x				
Random Stimuli	General	Random Word technique is the simplest technique where a randomly picked word is used to generate new associations.		x		x		
SIT	Engineering design, general design	Began as a variation of TRIZ at FORD but became more general and independent of databases.						
SODA	Engineering design	computer automated design for structural steel frameworks.		x				
Starbursting	General	a form of brainstorming that focuses on generating questions rather than answers. It can be used iteratively, with further layers of questioning about the answers to the initial set of questions.	internal		x	x		
Statistical design	Product design	It's an adaptation of robust parameter design methodology as statistically designed experiments for more efficient product and process design development		x				
Storyboarding	Design	A visual, structured and dynamic presentation of 'all that is known', to bring a group to the same level of knowledge.		x				x
Synectics	Design	Encourages the use of analogies to make the familiar strange. The origins of the technique are rooted in brainstorming to open up new insights.		x	x	x		
Tangible user interfaces (TUI)	Design	'Specifically, tabletop systems employing tangible user interfaces (TUIs) provide a new interactive design environment for collaborative design. Using a tabletop system, designers can interact with 3D digital models more directly and naturally using			x			
Task Analysis for Knowledge Description (TAKD)	Design	represent the problem space when reasoning about functional allocation		x				
The Affinity method	General	Group brainstorming method using post-its to generate a minimum of 20 ideas	internal		x	x		x
Transformational design	Engineering design	changing state or configuration in order to provide new functionality				x		

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Quality Function Deployment (QDF)		x				
Random Stimuli						
SIT						
SODA						
Starbursting						
Statistical design			x			
Storyboarding				x		
Synectics	x			x		
Tangible user interfaces (TUI)						
Task Analysis for Knowledge Description (TAKD)		x				
The Affinity method						
Transformational design						

Ideation tool summary

Name of ideation tool	Market segment	Context	Collaborative (internal/external)	Computer based	Germinal (aim to produce ideas from scratch)	Transformational/ incremental (generate ideas by modifying existing ones)	Progressive (generate ideas by repeating the same steps many times, generating ideas in discrete progressive steps)	Organizational (help designers group generate ideas in some meaningful way)
TRIZ	Engineering, design and human centered design	Thus, by extracting such shared essences out of a large number of excellent cases, and by making them easy to retrieve after classification, we may reuse them for facilitating new development of technologies. Especially, excellent cases of technology innovation can be understood in a number of patterns of breaking through the contradictions in the problem; such patterns provide us hints for our own creative innovation."		x				
Visualization technologies	Engineering design	This research investigates how three-dimensional (3D) technologies (3DT), an emerging cluster of visualization technologies, can revolutionize the presentation and utilization of organizational knowledge.		x				x
WordTree	Design	lead the designer to useful, but non-obvious analogies						x

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TRIZ		x				
Visualization technologies			x	x		
WordTree				x		

Based on the survey it is more clear that the majority of methods come from brainstorming techniques which is ironic considering the work of Osborn and Goldenberg who conducted tests over years that dispute the ability of brainstorming to be an effective approach to problem solving (Osborn 1957; Goldenberg et al. 1999). There is also an emphasis on technologically based ideation tools as well. I believe it's possible to use most of the tools with a client but that is a very different scenario from generating ideas with a client. By using most of these tools, the problem is already known, the solutions from the database are already known and although ideas cannot be made in isolation there is the ever present problem of generating ideas based on mental habits and as an iterative process of the main idea. It's my opinion that collaborative tools aim to generate something new that neither of the participants would have generated on their own and in that a collaborative tool for clients and designers is unique.

METHODOLOGY

This chapter describes the research methods used throughout the thesis by cross-referencing the thesis.

This section cross-references the thesis and focuses on what was done and why. A review of ideation research techniques revealed that ideation research utilized controlled, practice based and cognitive approaches to investigate the function of ideation and ideation tools. Given the constraints of resources and time opportunities that arose in design practice were used in order to balance ideation within the context of design practice that could be situated within more controlled situations and balance with a reflective approach.

Using practice-led research during design practice to capture information

Research that was conducted with Moixa Energy was based on the need to focus the research from a philosophical approach to design problems into a fact based research. It was appropriate to formulate a relevant problem or inquiry since the recipient would be a practice based designer and not an academic. The methods used in generating and assessing the data produced in the voice recordings and protocol analysis so that the research was focused enough to achieve a 'justified true belief (Greayling 2003; 37)' (Niedderer 2007, pp.5) or propositional knowledge the research must be satisfactory in light of some criteria. The definitions and rationales can be found on the following:

Chapter 4 Practice based views of ideation tools

I. Moixa Energy - Practice-led research or research through practice
    i. Page 61 (rationale for taking the design position and data collection)
    ii. Page 61-62 (introduction/definition of practice-led research)
    iii. Page 64-65 (analysis and reflection on the research)
    iv. Page 295 (evidenced by voice-recorded transcripts)

Conducting focused interviews among co-workers

Based on the work with Moixa Energy a question regarding ideation was proposed, but a literature review of this one off experience would not be sufficient therefore when a position with Symbian occurred, it offered an opportunity to conduct a more structured inquiry in a larger environment that was known to be dependent on innovation and fresh ideas. The definitions and rationales can be found on the following:

II. Symbian – Focused interviews
    i. Page 66 (rationale and data collection methods)
    ii. Page 66-67 (introduction and definition starting with last paragraph)
    iii. Page 68-69 (analysis)
    iv. Page 301-341 (evidenced by voice-recorded transcripts)

The methods and rationales for and of constructing an ideation tool are located on the following:

Chapter 5 Designing a collaborative face-to-face ideation tool

III. Since ideation tools tend to principally be defined by their end goal, I sought to define the ideation tool by defining my own goal. The aim was to create an environment that would catalyse idea generation between the client and designer.
   i. Page 60-63 (defining the components and their role: orientation, dialogue and context)
   ii. Page 64 (comparing quantum and probabilistic approaches for evaluating ideation process)
   iii. Page 67-68 (stating an intention for the types of ideas that the ideation tool could produce)

Capturing and analysing design activities using protocol analysis

The two prior activities were taken during design activities but they lacked structure to investigate a single question without an over analysis of the context, situation and unique aspects of each occurrence, therefore a more controlled design situation was designed in order to test what could be a possible solution (EiDOS) in comparison with a placebo and historically and contemporarily well known TRIZ. The rationales, set up, methods and outcomes of and for the design activities are located in the following:

Chapter 6 Protocol analysis of ideation tools and designers during design activities

VI. Design activities using EiDOS, TRIZ and Placebo
   i. Page 78-81 (expectations including explanation of protocol analysis and a constrained mode)
   ii. Page 81-82 (participants)
   iii. Page 82-83 (environment; i.e. physical aspects of the design activity setting)
   iv. Page 83-84 (data)
   v. Page 84-87 (methods, i.e. an extrapolation and details of protocol analysis vs. other methods of evaluating ideation and design activity assessments)

VII. Survey monkey for sampling knowledge of ideation tools from a larger pool of the general public
   i. Page 215 -216 (explanation for data, environment and participants)
   ii. Page 217 (results summary of survey)
   iii. Page 402-407 (raw data of whole survey)

PRACTICE BASED VIEWS OF IDEATION TOOLS

Practice led research or 'research through design' with Moixa Energy (June 2007 and August 2007) and Symbian (December 2007 to March 2008) exemplified conflicts that occurred during the ideation phase (Pedgley 2007)(Archer, 1999).

During the first year of the design MPhil, I was conducting a literature review that included chaos theory and fractals in order to use them as design tools for explaining patterns in the design process. It was about this time, I took a placement as a designer through the Shell Step Program with Moixa Energy[xxiv] between June and September 2007. Through the Step Program, Shell assists small environmentally innovative companies by pairing with students/professionals that could help them with their specific needs. Moixa Energy was selected by Shell for their award-winning product the USBCell, a USB rechargeable battery. Moixa Energy was established in 1987, and creates distinctive new technologies and product categories. They believe that the basic principle of 20th Century Power Supply; the AC 110/240v mains is simply inappropriate, inefficient and wasteful for 21st Century power needs. I worked directly with Simon Daniels, CEO/founder and Chris Wright, Co-Founder/ Design and Engineering Director, to develop web and point of sale (POS) marketing material for the USBCell and brand material for Moixa Energy. The design brief had three parts. The first and most important part was for the development of more relevant marketing material for their product USBCell (USB rechargeable battery) in order to increase sales and visibility. The second task was to design business paper and web templates. Lastly, they wanted a brand book, if time permitted. The design process was explained to the client during the first meeting. I characterized my informal design process or approach as three steps: opportunity, exploration and production. As a more detailed process regarding what occurred, it was similar to Nadler's 10 steps of design methodology[xxv] that include function determination, ideal system development, information gathering, alternative systems suggestions, select the feasible solution, formulate the system or solution, review the system design, test the system, performance measures established (Nadler, 1967 pp. B-647-B-648). Moixa Energy voice recordings were made consensually with the participants' knowledge beforehand through the Shell Step program coordinator who made the client aware of my status as an academic researcher and interest in the ideation phase. When the design work was undertaken, the client was fully aware and agreed that the first sessions where we were discussing what they needed, what I would be discussing the project, expectations and the ideas we would pursue as solutions was being voice recorded. They understood that I wanted to gain information on ideation and shared my view that the information would come naturally while we worked; therefore no other accommodations were necessary to capture data. One implication for deriving this type of voice recorded data during the design process was lessened by the unstructured interviews although it is an effective method of discovering underlying attitudes and providing indications of their importance (Wispe and Thayer, 1954).

The design methodology and voice recording provided resources and discovery that was characterized by Owain Pedgley (2007) who drew on the previous work of Archer, as 'research through design' (Archer, 1999) or

'practice led research'. The placement at Moixa Energy served as 'a mode of enquiry in which design practice was used to create an evidence base for something demonstrated or found out (Hales, 1987; Archer, 2004)' (Pedgley, 2007 pp. 463). The research conducted with Moixa Energy was not framed or pre-planned as practice-led and therefore in this sense it falls short of a full characterisation where Pedgley states that the consensus amongst researchers is that practice-led research must include substantial reflection, analysis and theorising on one's design activity and design outcomes if the work is to be differentiated from routine design practice (Frayling, 1997; Friedman, 1997; Cross, 1998; in press) (Pedgley 2007, pp. 464). I did however reflect substantially on the experience and analyse literature and research methods that had become more appropriate based on that experience. The research as a whole incorporated different methodological approaches, therefore based on resources and time it is not practical at this stage to provide a detailed theory and reflection of the 3-month experience. Moixa Energy can be characterized as practice-led although it does not have the breadth of analysis, there was a literature review being conducted at the same time regarding ideation but what also occurred during the practice-led research was what Schön calls 'reflection-in-action' or a way of describing a spontaneous and intuitive performance of everyday life in a way that I cannot say how I know but making judgements and using skills in a pattern of tacit knowing-in-action. It is the judgement and reflection on the action that results in a thinking about what we are doing while we are doing it. It is because of the roles I was playing both as practitioner and designer that 'reflection-in-action' is an appropriate description (Schön 1985, pp. 21-22).[xxvi]

The experience with Moixa Energy provided a turning point in the research. Prior to Moixa Energy, I did not have a singular problem or example about idea generation or decision-making in the design process. I could draw on experiences from prior design projects like designing the 2005 Environmental Action Agenda for the City of Seattle and research but it only verified creative and communication conflicts that occurred as a matter of being a designer. The first two conversations are examples that provided insights. One insight was that we had different ideas about the purpose of an ideation phase and the outcome. I had felt it was a time to engage the company's brand, previous work and extend the research into the market and in contrast Chris felt that a practical working approach was more appropriate. This is his response to me sketching out an 8-week (summer) schedule where there would be a week of research and the following week concepts would be drawn up for possible design directions.

> Okay fair enough, though I think you will, as you go along you'll find that all of those things that you thought were decisions that got made or things you'd - I think you'll find that by the time you get to you'll redo. I think my personal experience is you go on doing that same sort of process all the way through a project. Except it's kind of refined in focus as you go.

My suggestion of conducting research during the ideation instead of doing and providing an iterative for the client to see that something was being produced. My objection was that without understanding what I was producing I would inadvertently contribute to the devaluation of their brand. This relates to the second

problem which as that I had fewer preconceived notions regarding the outcome of the design process. The direction from my point of view was not centred around their brand but upon what their competitors and partners were doing and their aesthetic. This conversation is not unusual for when the client is describing a look and feel they would like to see within they marketing, but this approach can be counter productive when another company's look and feel begins to dictate the client's brand expression and strategy.

> Can you just quickly Google Marks & Spencer's… Just on that graphic. That's it. So there you've got this kind of graphics with this – kind of very black and white bold environmental sort of stuff where they've got lots of sort of commitments they're making. This is one of our clients. To some extent yeah, something like where the odd 15 billion things are, we can be kind of nice black and white bold statements. I kind of like their style, what they're doing in terms of big bold, you know, statement like a TV screen, sort of – this is bad, this is good. The other site which is interesting just on the environmental issue – if you just go to Solar Century, you Google it, in case I got the name wrong – Solar Century. Okay, so this is another corporate site for a company. Now, you try refresh, there's an advert they do that is quite nice. Just refresh it. Maybe you need to go – go to Products and now go back to the home page, Solar Century.

Taking a look at competitors and the greater market for aesthetics and to see what you like is perfectly normal, but I used these quotes to draw attention to the fact that neither of them draw on their own brand as a source of inspiration. The brand book was the last item on the list for them, while in my mind it could capture and inspire their all of their marketing strategies. This led to conversations about other company's look and feel without understanding how it can dilute their own brand and their own message. Although neither of these issues is specific to Moixa Energy, otherwise we would not have marketing trends per se; I was still concerned and curious why there was as such a gap not only in expectation of an ideation, the purpose of an ideation phase but also in communication between me and the client. How could the gap between my ideas and theirs be effectively bridged so that a real solution could evolve? In later conversations, Chris reflected on his experience in coming up with the USBCell and how that came about as an 'eureka moment' trying to solve a problem related to energy inefficiency. Nigel Cross has described eureka moments within the context of the design as building a "creative bridge" than taking a creative leap' (Cross, 1997 pp. 311).
Unfortunately, there is rarely a shortage of bridges the designers need to build in order to bring the client to go further or for designers to explain the nature of the problem and therefore justify their solution, but Cross's idea of sudden illuminations does not support a need or acknowledgement for the possibility that a paradigm shifting illumination could or should occur. The focus seems to be more about moving within the set space, which for all sakes and purposes is defined by the brief or the client. Given the nature of his creative leap, a different approach was needed so that the client and the designer could experience eureka moments during the design process such that the illumination could change the course of the design, especially if they were 'Thin-slicing' or simply fulfilling the design brief without acknowledging design complexities. I had defined 'Shared

Ah-ha moments' as an empathetic and creatively self-sustained communication brought about by the client and designer experiencing 'Ah-ha moments'. 'Ah-ha moments' are similar to 'Eureka moments' or 'an illumination, seeing a new synthesis; and verification' (Florida 2002 pp. 33). Since 'Eureka moments' can be an individual 'illumination', it may not be empathetic, communicated or incorporated into a design process; therefore 'Ah-ha moments' had been defined. The characteristics included empathy and dialogue. 'Shared Ah-ha moments' occur within 'the domains of interactions of the two organisms that are to some extent comparable, are such consensual orientating interactions possible and are the two organisms able to develop some conventional, but specific, system of communicative descriptions to orient each other to cooperative classes of interactions that are relevant for both' (Maturana and Varela, 1980 pp. 30). At that point, I tried to persuade Chris about the importance of Ah-ha moments and even 'Shared Ah-ha moments' by giving him a hypothetic scenario. If he and I could develop a new synthesis during our conversations and then the ideation phase could transform the design process and that the result may take us in a different direction. This isn't necessarily a bad thing because the new direction may be more appropriate than the outcome prescribed in the design brief. I tried to persuade him that this could occur during our design project and that Energizer and Duracell's marketing plan may not apply to USBCell. It was well received during the conversation but he differentiated his personal eureka moment experience from a design approach. We did experience a 'Shared Ah-ha moment' where we were able to leave the ideas we had coming into the project and develop something different. The sudden illumination or 'Shared Ah-ha moment' may not occur, but more importantly, instead of developing singularly focused ideation approaches within a design context where preconceived ideas are valued as efficient, the environment in which 'Shared Ah-ha moments' can occur is important for an open and creative design process.

There was substantial reflection on the experience with Moixa Energy and in particular ah-ha moments and the possibility of 'Shared Ah-ha moments.'

The experience of working with Moixa Energy is retrospectively characterized as practice led given that 'it involved me as a researcher undertaking a design project subservient to stated research aims and objectives. Practice-led research is defined as a 'mode of enquiry in which design practice is used to create an evidence base for something demonstrated or found out' (Pedgley 2007, pp. 463). Practice-led research is significant because it empowers academically competent designers to utilise their design expertise and assert ownership on design research (Pedgley 2007, pp. 463). Thus, the main motivation of practice-led researchers is to elicit and communicate new knowledge and theory originating from their own design practices. Its pursuance of course requires that the researcher is also a skilled designer and is prepared to combine the two roles of scholar and designer: something that is known to be intellectually challenging (Hales, 1987; Archer 2004a). After engaging with the client for three months, I identified my experience as a 'Model 1 practice -led process or to find out about current design practices (e.g., pursue a design project to help uncover decision-making processes and social responsibilities)' (Pedgley 2007 pp. 464). As a designer and researcher I had to conduct ideation as part of the design process and there was also an opportunity to understand how ideas were generated, communicated and prioritized for solutions during the design process that otherwise may have remained illusive and

inaccessible. As a result of the practice-led research with Moixa Energy I could better relate ideation research within practice and this narrowed the focus from patterns of design or ideation to 'the idea', committing language to represent an idea, communicating the idea to the other person and giving them sufficiently comprehensible information. This too had several levels of difficulty but the research began to focus on this issue of communication during ideation because our first conversations impacted the whole of the design process. There were other issues like the designer or client's short term and long-term motivation within the project. Concerning Moixa Energy, there was an excitement for the next project and perhaps a relief to see the USBCell come to fruition in transforming the mobile power market and allow them to move on. This again is not unusual, but by having this kind of 5 year plan whether it comes to fruition or not, there is little need to create a brand or map it's way according to the product and it's promise. The design process becomes little more than one strategic move after another surviving within its own context. The Moixa experience provided a focus, that improving communication during ideation could be helpful for developing ideas even if we understand that the process of thinking can be a self-centered process for both the client and the designer. Moixa Energy had defined the value of ideas and design ideation within an environment where outcomes are controlled as much as possible and in line with the best possible outcome. Moixa Energy, for example, referred to their competitors and clients for the safe or emerging trends even when risk taking or drawing on their own brand may have generated far more benefits in both the short and long term. The complex problems such as transforming branding into marketing strategy must be engaged and do not have innovative solutions that are predictable. The relationship between the client and designer and in fact their views of who can generate creative ideas and why they are necessary has strong cultural attributes. Eastern cultures for example 'the idea of the universe as an interconnected whole is not new; for millennia it's been one of the core assumptions underlying Eastern philosophies. What is new is that Western science is slowly beginning to realize that some elements of that ancient lore might have been correct' (Radin 2006 pp. 3). 'The Idea' for this research is critical because the history and definition of 'The Idea' not only provides context regarding who and how we develop ideas, but what 'The Idea' is so that when we generate ideas, we have verification.

A continuing literature review, reflection and my experience with Moixa Energy provided a platform of knowledge and more focused questions that informed my experience at Symbian. While I recognized the Moixa Energy experience might have benefited from an ideation tool or a mutually defined ideation phase, were the same dynamics present with larger companies and were my observations consistent with other designers or their clients? Symbian was a great opportunity that emerged from a temporary administrative position. When the initial position was complete, I was recommended for two other positions that are the focus in this section. The migration of research going from practice to research was necessary for this research. Ideation research can be overly dependent on practice based or within a controlled scenario. This approach can provide a breadth of knowledge about the occurrence, but they have not resulted in a consensus regarding ideation or cognition. Applying a reflection-in-action approach to research can be construed as not being thorough, but the practice of design is reflection-in-action. I am applying Schön's term since it describes a relevant method of 'understanding phenomena, ways of framing the problematic situations encountered in day-to-day experience. It is acquired through training, or through on-the-job experience. It is usually tacit, and it is delivered spontaneously, without conscious deliberation. It works, in the sense of yielding intended consequences, so long as practice situations falls within the boundaries of the norm and routine. It is a dynamic knowing process, rather than a static body of knowledge, in the sense that it takes the form of continuing detection and correction of error, on-line fine-tuning, all within the framework of a relatively unchanging system of understanding' (Schön, 1985 pp. 24). Schön's reflection-in-action is an effective approach because practice and research inform each other which brings our weaknesses in the research and also brings a sense of relevance within practice.

The experience with Symbian provided 2 resources in the form of voice recordings related to design ideation within a larger company. I spent 4 months between the two roles; the first was an assistant to 3 vice presidents heading sales departments during December 2007 and moved into the Global Marketing department from January till March 2008, where my role was a web and graphic designer. In that time it was not possible to conduct more interviews or observe design meetings. These meetings were the only meetings I was able to attend and the only time that I was able to engage with other employees regarding their ideation and idea generation experience in Symbian simply because of logistics, my workload, confidentiality issues and time constraints.

While in these roles I was able to voice record a focused interview and a design session. The focused interview fulfilled the criteria regarding the participant knowledge, the researcher's prior experience with the topic and that the interviews contributed to the research. The methodological framework in which the data was gathered was similar to that of Moixa Energy in that it was ‘research through design’ (Archer, 1999) and like Moixa Energy the conversations were voice recorded with prior participant and company consent. The main difference was that as opposed to Moixa Energy, where the subject matter was formed through practice, this experience began to answer specific questions about ideation and client designer communication, thereby changing my role as participant and designer to observer and investigator within the context of a larger company. The focus of the

investigation was between the client and the designer from the participants' perspective not mine. The client and the designer were part of the same company, having worked along side each other in some cases over a matter of years with the opportunity to work on a daily basis.

This research defines the participants as resources of the knowledge either through their recollection of experience or of the experience itself. There are studies where knowledge within the design process is the focus, for example, Bertola and Teixeira conducted research of over 30 case studies in order to identify how design activities adapt to different contexts in accessing different knowledge domains (Bertola and Teixeira 2003, pp. 181) and the actual domains they defined are useful. They provide three specific domains: user's community knowledge - knowledge contained in everyday practices of individuals, organizational – knowledge embedded in organizational routes, processes and practices, as well as tacit and explicit knowledge possessed by employees, knowledge and network knowledge – knowledge developed spontaneously, or through private or public policy and diffused through networks of individual and communities... (Bertola and Teixeira 2003 pp. 182). The domains identify the two sets of participants within the organization, characterise their role and their ideas as sources of innovation, which is a different context to the author who uses the domains to access knowledge agents in the organization. The most relevant descriptors of the knowledge agents are user's community knowledge that describes the focused interview while the organizational knowledge was provided through observation of the design and client meeting. Unlike Paul Carlile's 'A Pragmatic View of Knowledge and Boundaries: Boundary Objects in New Product Development' this research does not extend into the area of how knowledge is transferred within the organization.

While working as an assistant, I was able to, with permission, voice record a design meeting held between VP's and the lead designer, Gareth, for the launch of new account service during the 10-year celebration. This recording gave insight as to a designer's process, the client interaction and immediate outcomes. It also allowed me as a participant during the meeting to observe the design process with another designer leading the process. Methodologically speaking, practice-led research does not frame either recording accurately because of my role as participant and the research being secondary to the activity. The intention was to build a picture within a practice based context where I am gathering information that originated outside of my research. Protocol analysis is a method of capturing the design process as a resource of describing the design process from different perspectives (client, designer and observer-participant) but they will not be saying what they think as part of the protocol. Protocol analysis in this case is being used to capture the data as it occurs using the normal dialogue they use for conducting their design session. The first meeting was scheduled to design a presentation of the new sales teams to augment a sales strategy launch. There were 4 participants including 3 sales Vice Presidents, Gareth a designer (Male 4) and myself as a personal assistant to the vice presidents.

AUDIO START

Male 1: Is [Hughsy 0:00:23] on his way or…?

Male 2: He's on his way. He said he'll be fifteen minutes late.

Male 3: Do you want to [check 0:00:33] before the meeting. So you've got, do you want to get [?? 0:00:39] structure. How do they go? Who goes? What are we trying to cover? What's the key message.

Male 1: Yes.

Male 3: That will help us [?? 0:00:53] the indication for the event itself that follows the [?? 0:00:58] accounting [?? 0:01:01].

Male 1: Yes.

Male 3: So I'm dealing with Account, part Accounting people.

Male 1: Yes some of that was said the other day to Andy, he seems quite keen on that doesn't he?

Male 3: He is keen on that.

Male 1: Yes.

Male 3: Alright accounting people so that's the…that's kind of the launch event for the whole idea. And Gareth is putting together in parallel with that a [?? 0:01:20] website.

Male 4: Just a general comment.

Male 1: So objective is, first objective is formally launch Accounting with great fanfare [?? 0:01:39] that's thinking timeframe.

Male 4: Okay, I can do that.

Male 1: Even better than your multimedia cubes mate.

Male 4: Do you want some multimedia cubes?

Male 1: Might need some.

Male 4: I can have a multimedia open sequence. Think about it, glorious. Gets people's attention sets the standard. Sends a subconscious message that you value what they're about to do because you've spent this kind of money on them. Plus it's more fun. Well what else can you do?

Male 2: Did you have a good night?

Male 4: No. I didn't get drunk. I was quite sober actually I just had about three bottles of beer.

Male 3: The other thing we have to do is to energise the sales team.

Male 1: Yes.

There were two significant observations from the design meeting recording for this research. The first is that the designer had formulated a design solution within 3 minutes of the meeting without having details of the

meeting or the design requirements. This was done with the client in that the client saw the cubes as a solution and being that Gareth liked them and multimedia the solution was set. This design process is contrary to process that prioritize outcomes instead of evolving problem solving processes including ideation. Gareth's approach is similar to industry and even award-winning firms that stress maximizing efficiency and profit less than they do turning out unique, aesthetically or technically notable projects (Blau and William, 1979 pp. 216-217). This observation is a bit simplistic in that creatives can often aim toward continually evolving new creative solutions but it is my observation of these this audio tape that prior experience and mental habits were more influential. The designer and other participants of the meeting experienced different types of dialog. It's important to mention even though loud speech may be the only one that receives much attention. Vygotsky describes 'loud speech, whisper, and inner speech' (Vygotsky, 1986 pp. 84). The loud speech for example is what was heard and transcribed. The whisper can be observed by participants whispering to themselves during the meeting. They may consciously or unconsciously whisper ideas and responses to be formulated later. Inner speech is privileged to the participant. I am interested in these censored and dismissed thoughts. While inner speech and whispering could guide us a step closer toward understanding ideation they are in a broader context signalling an unobservable and often unverifiable transformative process between ideation and language. John B. Watson has argued from a functional psychology point of view that all silent thinking is nothing but "egocentric" speech. He has gone on to state that inner speech serves individual rather than social adaptation (Vygotsky, 1986 pp. 32). While I agree in its current form this is true, but as an inner speech it is a social adaptation within a culture where any of the participants may feel unqualified to give an opinion. Understanding more about the mechanisms that keep inner speech inner is critical to opening up a dialog during such meetings. I believe this is critical to derailing such prevalent mental habits that can overlook solutions. Inner and outer speech can be used to reflect on how the client and designer might communicate within their own mental spaces. Inner and outer speeches are chosen specifically because there is a threshold that is breached when we move from inner speech to conversation with the client. Within an ideation phase individuals may experience inner speech as described by Trimbur.

> We construct this inwardness, much as in Vygotsky's view we construct the self through social relationships. Inwardness is not an inherent property of the mind, given as part of our biological endowment… Our mental lives rather are extensions of social experience inward. (Trimbur 1987, pp. 21)

I am more cautious in the way in which inner speech is described. Although I agree that language to describe inner speech or ideas can 'permeate with intentions' (Trimbur 1987, pp. 219) and that we borrow language to describe new thoughts as we experience them, I believe languages evolve in order to describe other things whether they are artifacts, feelings or ideas. These languages may not be comparable to each other. The relation between the words and artifacts, feelings and ideas has been reviewed to show that they are arbitrary in nature.

The second outcome was that during an hour long meeting the rest of the meeting could be summarized as a

process of clarification and iteration of specific information and format but there were no significant changes of the design outcome or to the designer's initial communication solution of using the cubes. Neither of the outcomes point to a break down in communication so much that they point to observations of the designer's mental habits, the role of ideation sessions and the iterative process that occurs during the design process.

While working in the marketing department, I conducted a focused interview that was initially instigated as part of my work to get information about the Global Communications projects since its inception as a department. The project manager allowed me to go further with a participant (SYM1) who anonymously participated as I enquired about their experience in developing ideas, their process and experience within Symbian. While my line manager was aware I was also a student conducting research, there were no other considerations given to facilitate this role or the research. The recording was with a participant who had a role in the Global Communications team and I was tasked to provide material for past projects. The participant was one of the original employees in the department and it lead to an opportunity to discuss their process within Symbian. The participant provided insights into both the barriers but also the success of collaboration with an internal client. The participant being interviewed was known to have been involved in a particular concrete situation, in this case that they have designed and communicated ideas within Symbian. The topic of ideation had been investigated and analysed through and as a result of the work with Moixa Energy. Based on the experience with Moixa Energy a new set of questions emerged setting a more focused area of study in which the interviews could provide some clarity. The interview itself is focused on the subjective experiences of persons exposed to the pre-analyzed situation (Kendall and Merton, 1946 pp. 542).

There are two excerpts that are one dialogue broken into two sections. The first excerpt is the first part of the conversation with the participant regarding their experience designing within Symbian. I focused on questions regarding the participant's design process within Symbian as opposed to either an accepted or interpreted method of engagement. The second excerpt focuses on the participant's experience and then to put the questions as a hypothetical situation whether the participant and the client could work together for a solution and if this was possible or if it had occurred.

EXCERPT ONE

K: Okay. Do you find – do you feel that what you feel, instinctively, comes through in the communications or do you feel as though you're translating? You get guidance from above and...

S: Okay – okay. Yes, I think that's generally the case – that there is – this is a um, it's a classic case of a manufacturing company, and manufacturing companies, okay, it's not only us, Psion was a manufacturer of ?PDAs to the software and the hardware, right. And so is Nokia, so is Sony Ericsson. And you're moving into a world that Microsoft has shown the way to go, right. They're a software company, and they sell software but they package it properly, they have ???the customer as their developer. And that's not been the case with manufacturing companies going through monumental

changes, in moving from being, you know, consumer electronics brands to software and services brands, and still with consumer electronics involved obviously, in Nokia, but also big, big changes in the software services side.

K: Now, do you feel, generically speaking, regardless of whether it's the software company or another company, the ability to keep, maintain or establish um, an intuitive aspect in the way you're coming up with ideas, with the needs – is there kind of a meeting of the minds where your intuition is taken into consideration, on a par with what's come down – or is that more of a level or position that's more important than it is the actual idea? You come up with a brilliant idea, it may ??? with what they decided, the new direction to go into, do they meet on a level playing field or is it taking into consideration to the – is there a negotiation around it? And the reason why I ask that is because, by the nature of having a company that's dependent on either viral or grassroots or anything like that, innovation can happen, has to happen at the bottom level. Hierarchical structures don't enable creativity or innovation in that way. It's almost a reversal which is, you know, you did have the dot com boom, but although, logistically not rich, or practically rich, conceptually and innovatively it is. So it's kind of interesting to – I'd like to get your take on that negotiation, between the ideas that you have from this level, with the direction that you ??

S: Yeah, well, as I say I think there's – my background's marketing, right, so I'm pure marketing. So – and I think that's, you know, not everybody in marketing, in fact a large majority of marketing is not marketing, they're not marketing-trained, they're engineers, or, so I think there's necessarily you have to filter out what senior management want into what is actually required, needed. That's what you're asking.

K: To a degree it's more symptomatic. It's kind of either a design or marketing role, sifting through what they're saying, to they're really needing.

S: Yeah. That's classic, right. You have to do that anyway, with any – you know, your customer at that point is your boss, saying I need – I want this, fine, how's that fit into what I'm doing and what is actually needed, ...

K: But there's an irony when it misses the mark, because then neither of you are really happy because it's not really the need that you see, and then it's not the way that they thought they would see it. And I'm talking purely from a visual what's in my head type thing.

S: Yes, indeed.

END

The participant confirmed a communication conflict with their internal client. This is not unusual and in fact

there are ample resources that describe the plight of the designer that have been previously outlined, but in this case it was important to take one more step and ask the participant to reflect on the client's process, the client's ability to have a eureka moment and the opportunity to use that common and unpredictable occurrence to develop solutions.

EXCERPT 2

K: Okay. That's essentially the negotiation I'm talking about for my PhD, so it's interesting...

S: Aha, yeah, yeah. I would – my solution on this is that it's to do with – you can have market or you can have industry knowledge, but that doesn't necessarily give you the um, the actual job skills, necessarily, to – so, from my point of view, right, I have a specialism in understanding information, marcomms, communications, that's why I'm product managing at the moment, I'm dealing with this kind of very core part of the business, so this is something I always deal with. I've always been writing for audiences, understanding what do they see – understanding the media communicating it, why you're communicating with that media, how long will it last, lead times in, you know, um, the life cycle of the products, and the impact of those products, how you follow them up, um, now not necessarily, so for example if your CFO comes to you and says right, I want to do a publication on X, you're going to say okay, fine, all right, you're a CFO and you're financing this, that's good, but yes, I'll have to translate some of your requirements into things that will actually work in the outside world.

K: When you're doing that, when you're listing all the things that enable you to do your job, where ?in line does it come with an instinct that you're not exactly able to do um, to explain, where you just kind of come up with an idea, and some of these things...

S: Sort of thin slicing?

K: To a degree, yes. Thin slicing, based on the experience that you have. Now I would almost believe that the CFO would have, when he comes to you, more of a eureka moment, when he thinks that a good idea will work, as opposed to slicing, because that's not his speciality, and it seems like the difference between his eureka moment and your thin slicing, it's interesting.

S: Yes. It is interesting. [laughs] How would you put that – you would say the eureka moment is, they've obviously identified a requirement to communicate generally, because we're talking about marketing marcomms, and that eureka moment is, um –

K: So it would be hard for you to maintain as being your professional and you're deriving what would work, based on what you ?know?

S: Say that again?

K: When I come to you not knowing what you do or how you do it, and I'm just saying I have a great idea, I just like – you know on my way to work and I'm like I want to do this. And when I communicate it to you, it's almost as though your position is to thin-slice that and make it into a tangible and, or a return on investment and all these other things. But somewhere in there, when you're coming up with a solution, you're having your moment as well, and it's not um ..???. It's not just about thin slicing, because even though you're experience informs your decision, there are times that you may go into a critique, or however you want to call it, feedback, and the idea that you had, you're going to justify it. It's almost as though an artist makes a piece of work, and based on his god, or based on what they envision, and then goes into a – goes into a critique where they say well, my influences are such and such and this is how I'm justifying the work, when in some reality, some of that can never be justified, it's only a post – mortem of that, and even though your percentage of thin slicing is probably ninety ten, it's that 10% that you're accessing that you're still excited about, that you want to do it, that actually is the part that inspires you to do the job or come up with solutions. The most knowledgeable person about painting may not be able to paint shit. But a person who does not have that ability, does not know why they do it, still could produce a piece of work that could be sold for a high amount. So ... and I don't' expect that you'll be able to access and disseminate a level of thin slicing what you're excited about, but I would say that at least on the level that you are excited, you might be able to relate more on the level that they're excited, and bring some context into where they're actually coming from, as opposed to thin slicing.

S: Sure. So, all right, here's um. You've rung a bell. So we did a campaign called Symbian Smartphones with dummies. Date -2005, at the best guess. Symbian Smartphones for Dummies obviously was the 'for dummies' brand, obviously, who doesn't write. It's obviously customer publishing.

K: Yes, I've seen the book, it's on –

S: Yeah. So that was my baby, written by me, Fred and Phil, actually. I did that for David Levitt, who was quite chummy with Charles Dunstan at the time, so David said ??? these Dummies books, I said all right, yeah, okay, so. You can do a Dummies book, what are we going to do with it, right? We'll print 100,000 copies of these thing, which we probably did. Was it 100,000? It was a hell of a lot of copies, anyway, and said okay, we'll work with Carphone Warehouse to distribute them through Carphone Warehouse. Now, at this point, I was saying, give it away for free, you lose – you instantly lose any way of measuring it, because it's free, Dummies brand is strong, it'll just fly out the door, you'll never see it again, you'll never know what effect it had. So don't do that, price it, make it £9.99, do a deal with Carphone Warehouse to sell it with boxes of phones. That of course is a good idea in principle and practice, hard because you've got to work with – you've got to pay Carphone Warehouse and you've got to get them to agree to box it in the warehouse and all the rest of it, work out how they're going to price it at the till, you know, there are a number of additional issues at the retail side there, plus

> remembering that of course Carphone Warehouse are box-shifters. They don't give a – ultimately, those guys at Carphone Warehouse are not great salesmen, but they just want to sell a mobile phone every 45 seconds, I think is the rule, so they don't give a damn about the book, if it helps them sell it, yeah, fine, just – so you're not going to have any sales help for that. So we went through this and so on, and I pitched up and said look, we can do this, but it will cost us, because Carphone Warehouse are not going to just give it away for free, right, they're going to want us to – it's a promotion for Symbian here, but that didn't work. So the initial idea of Smartphones for Dummies, great, but in practice it went to a free at a little book fair, and it was a free giveaway. And I think we gave 30,000 or something, 30 or 50, it was a lot, to Carphone Warehouse that went in a weekend, in about 5 branches in London, they just went whoosh! And gone. But, so there's an example of perhaps what you're after, where you're saying it's a good idea in principle, in practice if we don't do certain things, for sure we can test the ROI in some way, how many Symbian phones did this sell, or sold with the Smartphone s book, then we've really just spent 30, 40 grand on paper. Or, at best, relationship building for Carphone Warehouse.

The second excerpt was supposed to elicit information about collaborative ideation if the participant had any experiences. The participant answered my question by providing information about the benefits of unpredictable results even when the process and context are well understood. The participant confirmed communication conflicts relating to ideas and the design process within a corporation even one such as Symbian employees are never more than 3 hierarchical layers of supervision from the CEO.

The recordings provided variations of ideation experiences separate from the researchers. The voice recordings provide examples as to why and how ideation tools could be useful between the client and the designer. In the first voice recording and ideation tool may have orientated the designer and the clients to the new project and while they may have had ideas about how to engage and solve the problem, they could first establish a working understanding of the design problem and this step could inform the rest of the process of developing a solution. Given the constraints of time and the activity, starting from scratch for every design session is difficult, especially if there is a recognized speciality such as making multimedia that the clients are excited about and feel comfortable with. The designer who generated a solution within the first 3 minutes of the meeting in this case reaffirms that. This is an example where the designer did not engage or fully understand the problem first and he relied on mental habits and prior solutions that may or may not be adequate. The designer facilitated the conversation often going back and forth between what they were say and what he understood, but at times was resigned to ask the stakeholders opinions regarding how they viewed the solution. The dialogue reflected an exchange of the status quo when dialogue can be a tool the designer can use to facilitate 'something that takes shape in their mutual discussions and actions, rather than something that is conveyed from one person who acts as an authority to the others or who acts as passive instruments of this authority' (Bohm 2007, pp. 3-4). There was no guidance through the design process; it was an iterative process that was inspired by lacking details in

the brief. As the participant from the second recording stated the process would benefit from better communication so that both the client and the designer generate a solution they both understand and can support. The second voice recording provided participants examples and the research benefits greatly from their participation, their openness to reflect on their own practice and their ability to empathize the client's process as well. It sets a groundwork that makes it possible to envision the designer guiding the client through the design process. The full transcripts are in the Appendix.

I applied an existing ideation tool, TRIZ, to Moixa Energy's design brief in order to highlight possible limitations, can make a comparison.

After the practice-led research with Moixa Energy questions were raised regarding what tools were available to help in this situation and how appropriate they were for improving communication and creativity. Both of these attributes are necessary for generating solutions. Considering the variety of ideation tools available, not to mention other idea generating tools like mind mapping, I have chosen TRIZ as an ideation tool to apply to Moixa Energy. I am not a TRIZ expert and traditionally TRIZ would be applied during the design process but the exercise provides insights regarding how they could have been applied given the design brief to a real example such as Moixa Energy. Applying TRIZ to the brief can provide a broad picture and if there are any weaknesses it can be more apparent. TRIZ has emerged as one of the oldest, published, a practised and archived ideation method that has retained its basic structure. Genrich Altshuller, a Russian, who had access to over 40k patents, developed TRIZ in 1946 by. While he looked for common links between inventions he developed not only a hierarchy of creativity but also a knowledge base in which to derive a method of overcoming contradictions in technology. TRIZ was developed on the philosophy that 'improvements, innovations, and evolutions of technologies share some common aspects across their fields and their eras' (Nakagawa, 1998 pp. 1). TRIZ is a well-known and influential design ideation tool to develop innovative solutions through contradiction of design parameters that has been modified since it's 1946 inception. In an ideal scenario, the designer would use TRIZ and at the end of 40 steps the designer would provide Moixa Energy with POS and marketing solutions to increases sales, visibility and market share like their competitors. In this spirit of highlighting possible limitations of ideation tools within practice, I will apply 40 steps of TRIZ provided by TRIZ Journal to the first voice recorded ideation session and demonstrate how TRIZ could or could not be applied to fulfil the clients' design goals.

TRIZ could be effective for providing solutions for Moixa Energy but steps 1, 3, 4, 5, 8, 9, 14, 17, 18, 21, 27, 29, 30, 31, 33, 34 and 36-40 do not apply. TRIZ is designed for engineers and this becomes evident especially during steps 36-40, but it is first and foremost a method of innovation that applied to engineering. While TRIZ has been applied to many fields, design being one of them, designers have used TRIZ in combination with other methods in order to address wicked problems that TRIZ alone could not address. Human Centred Design (HCD), for example, has been developed in order to compensate for a lack of consumer interaction while using TRIZ within the design process for product development (Van Pelt, A., Hey, Jonathan 2007; Chen et al. 2009). A TRIZ based approach has also been developed from biology. Dr. Julien Vincent the director of the Centre for Biomimetic and Natural Technologies at the University of Bath in England has pioneered a method of developing inventions from nature. Biomimetics was developed 'to capitalize on the wealth of designs and processes found in nature by devising a "biological patents" database that will enable engineers to directly tap into nature's ingenuity bypassing the need to consult with biologists that they have come to rely upon for insight into nature's workings' (Butler 2005 pp. 1). Dr. Vincent estimates that we only have a 10%

overlap between technology and biology. Considering we only know about 2% of the function of our own DNA, ideation becomes more important given the unpredictable effects of design and an overwhelming desire to capitalize on opportunities (Cilliers 1998, pp. 1). Applying TRIZ to Moixa Energy illustrated a heavily materials based approach and while TRIZ is known for developing innovation through contradiction, the problems that faced Moixa Energy were more complex. TRIZ could not address interaction, the different perceptions of the design process, managing the client's expectations, the purpose of a brand and communication/negotiating skills or different or emerging design contexts. The function of the designer and the design processes cannot be solidified into 40 steps, nor can they be effectively checked off on a list for every design project. Charles Landry, author of the Creative City, recognized the need to involve those affected by a problem in implementing solutions Providing an environment for problem-solving that permits open-minded learning opportunities both for decision-makers and those affected by them by generating solutions that are culturally, economically, socially and environmentally sustainable (Landry 2000 pp. 20).

The challenges designer face in managing the design process is not unique to the Moixa Energy experience, but it is a relevant piece of design research when the specific concern are ideation conflicts that inhibit creative collaboration between the client and the designer. Balancing the clients' expectations of the process that include expectations of the designer's role, the process and the outcome are ever-present challenges. Ideation tools have been used to control the outcomes of the design process, but they can be much more effective for guiding the design process. Engaging clients with ideation tools also means that they have some intention of having an open and engaging ideation. Aune stated that in order to do this they must actually have the relevant intentions and beliefs and then have a structure of that reasoning that actually conforms to the indicated pattern (Aune 1990, pp. 248). Clients recognize the need for creativity and a designer, but the creative solution finding process can easily be transformed into a strategic negotiation (Le Dante and Do 2009). This is due in part because of the perceived role of design that contributes to the design process is dominated by the client (Black 1999; Richardson 1993). When the client is unable to see the difference between meretricious and a creative solution, the task of the honest designer is insufferably increased. The designer then knows that the acceptance of his work will depend not on rational judgement but on his own powers of persuasion, on his capacity for convincing argument, which the designer feels isolated and desperate, knowing that the entire creative energy must come from him alone, with the client as useless as an irresponsible judge. It is therefore not surprising that designers who are doomed to work for blind and dogmatic clients rarely survive the unequal battle and finish up not very different from the second-rate hacks who lack integrity from the start (Black 1999, pp. 110). The relationship in social terms between a 'client' and a 'designer' is not equal and their roles can adversely affect creativity. Design has yet to be recognized as a major profession. 'Nathan Glazer has called the “major” professions of medicine, law, and business, along with such “minor” professions as social work, education, and town planning, are based on an epistemology of practice embedded in the modern research university where these professions established their schools' (Schön 1985, pp. 5). As a direct result of it being a client led design

ideation, the client and design brief heavily influence the process. This impact has not gone unnoticed, but when ideation tools are designed to optimize the client's desired outcome, the role of the ideation tools and ideation can inhibit a creative or risk taking idea generation process. The impact has contributed to the rise in technology based ideation tools for more efficient and predictable results. Bonsiepe wrote about the unresolved methodological conflict between scientific and design methodologies during the 60's but he also highlights the importance of design in that 'design is the last component of the chain of innovation through which scientific and technological innovation is introduced into everyday practice in society'. Bonsiepe stated that design is 'the last component of the chain of innovation through which scientific and technological innovation is introduced into everyday practice in society' and while this may be true, it is can also be stated that there is an uneven attention given because there is an economic driver behind and for design to be innovative justifying design outcomes and intentions (Bonsiepe 1995, pp. 36). There is a paradox between the role of an ideation tool for generating ideas and an ideation tool that helps to realize preconceived design solutions. When the design process and ideation tools affirm an intention, creativity suffers. Concerted steps must be made to develop design ideation for the client and designer as a creative process 'quaerendo invenietis' or 'by seeking, you will discover' (Hofstadter 2000 pp. 9). In order for any new synthesis to occur it would involve change on the highest level, meaning the designer, decision makers and stockholders. Heidegger commented for example, that conceptual awareness occurs when the process breaks down (Godwin et al. 1997, pp. 320). If breaking down the design process is essential for developing new ideas then new relationships between the client and the designer need to evolve from a current designer and client paradigm that Black perceives. Breaking down the design process starting with the ideation phase through the ideation tool can open up a more effective method. The first step of the ideation tool as a platform will be to establish an environment where the client and the designer are equal. Within this environment, they can work together as equals. This engagement changes the current social paradigm of privileged knowledge and creatively ineffective hierarchical approaches. This is also an emergent process and through dialogue they can generate ideas that they were not privy to alone. The second step is to develop a context outside of the immediate task in which the complex problem lies. By doing this, they could more effectively understand the natures of the problem(s). This also serves to expose mental habits of both the client and the designer. In this regard each design project is new and must be engaged. The outcome of these considerations is a new type of ideation tool to generate possibilities. The outcome as ideas could then be put through whatever technological or ideation process to narrow down specific needs, but at the onset a broader consideration of context, exercise in creativity and improved dialogue are critical.

DESIGNING A COLLABORATIVE FACE-TO-FACE IDEATION TOOL

I have invented a novel ideation tool that I call EiDOS. It was designed for use by designers and their clients. I will show how it carries the designer and client through the design process, in a way that increases the range of possible design outcomes. This is a useful innovation because design outcomes are critically affected by early decisions made during the conceptual or ideation stage (Thackara 2006, pp. 1; Goldschmidt and Tatsa 2005, pp. 593; Vygotsky 1998, pp. 6; Bateson 2000, pp. 229; de Bono 1971, pp. 6).

The formalization of the research into an ideation tool can be summarized as a recognition of a need within industry for a processed based tool (as opposed to an outcome based approach) to help designers guide the client through the design process of complex problems (Shah and Vargas-Hernandez 2003, pp. 115). There is a multiplicity of factors that contribute to and affect this relationship which have been corroborated Cross and Clayburn and Cross 1995, Gabriel 2000, Olson and Olson 2000, Olson et al. 1992, Zolin et al. 2004 and Kan and Gero 2008. by numerous researchers. They include role and relationship, trust, social skills, common ground, organizational context, and socio-technical conditions. Shah and Vargas-Hernandez provide a detailed categorization of design ideation tools primarily for engineers. It appears to have been developed between designers and cognitive psychologists. They describe to major categories of ideation tools that are intuitive and logical Intuitive methods use mechanisms to break what are believed to mental blocks. Logical methods involve systematic decomposition and analysis of the problem, relying heavily on technical databases and direct use of science and engineering principles (Shah and Vargas-Hernandez 2002, pp. 112). I propose an algorithmic ideation tool for the designer to guide the client through the design process. EiDOS is a hybrid of both logical and intuitive methods. As it relates to a design process it's difficult to separate the two. I am using an algorithm because it is like TRIZ, lateral thinking tools, decision based design in that they are adaptable as inventive tools for complexity (Mistree et al 1990, de Bono 1971; Chen et al. 2009). In addition, it is also a method of guiding as opposed to repeating steps or developing a database of solutions. The algorithm needs to be broad enough to adapt to many different kinds of briefs while providing support (i.e. addressing context) to address complex problems and communication where Bohm has provided significant research as it relates to creativity. The algorithm is divided into 3 steps: orientation, dialogue and context. The algorithm is designed with the explicit purpose of catalysing the generating possibilities between the client and the designer in order to more effectively address complex design problems.

EiDOS is designed specifically to increase possibilities by integrating orientation, dialogue and context that are recognized as key contributors for generating creative ideas (Benyus 2005; Buchanan 1992; Chen et al. 2007; Corkhill and Guenter 1969).

EiDOS was conceived as a tool for designers with the potential to influence the rest of the design process as much as the ideation/the conceptual phase. EiDOS reflects both practical and literature based research.
I propose an ideation tool that catalyses the design process such that it encourages and facilitates an environment where ideas can be more easily and effectively generated through dialogue and increased by considering pragmatic, probabilistic and existential contexts resulting in more possibilities to address complex design problems.

Orientation

Maturana and Varela describe linguistic behavior as an orientating behavior so that the orientee can be oriented within the cognitive domain that is independent of the nature of the orientating interactions. When the client and the designer are not adequately orientated the communication, design outcomes can suffer through misrepresentation. An orientation can occur as a matter of each person stating their each person stating his or her positions. Orientation as an algorithmic step, it is concerned with transcribing ideas that the client and the designer have after reviewing the brief. This step is meant to expose prior truths and ideas of prior experience. This exercise may or may not be what they are thinking but if we recall the reference to stances and beliefs (Chakravartty) the design process can be depicted as a communication of stances and beliefs instead of a communication of ideas. This is not meant as a purging exercise, but because of the mental habits that occur with the client and the designer, writing them down can be useful for awareness. Given the nature of generating creative ideas, the focus is not to apply other solutions but to engage each other and develop a solution for the design problem at hand. The goals are to set the groundwork for an effective dialogue between the client and designer because 'face-to-face interaction remains one of the most important elements in developing ideas (Salter and Gann 2002) (Kan and Gero 2008, pp. 315).

Dialogue

Dialogue can allow the designer to establish an environment free of hierarchy where both the client and the designer feel free to discuss ideas. Gumperz and Levison have stated the way the designer and the client talk to each other affects how they think. (Gumperz & Levinson 1996, pp. 26–27)' (Gleitman and Li 2002, pp. 267). The types of dialog that will be used to model an ideation tool will be based on Robert Glanville's models in which we hope to achieve while Bohm provides some guidance within the dialog in order to achieve a creative communication. Glanville's dialogues can take one of four types and I we will be emphasizing the third. The first, the represented remains the same and the representing changes. This is the mechanism that allows agreement including the agreement to disagree to be negotiated. The second, the represented changes while the

representing remains the same. In this case, there is a new topic of conversation. We start to talk of something different and new. This dialogue could be useful if both the represented and the representing are open to something else. Otherwise this representation is akin to compromise, negotiation or discussion ensues. Third, both the represented and the representing change. When this happens, we have a free-wheeling conversation, a brainstorm, stream of consciousness, hunting for whatever we may, eventually, find. It is not necessary that we know what we are hunting for before the event of discovering it. This dialogue of the four dialogues it is the most ideal. The fourth and finally, we have the case that neither represented nor representing are changed, leading to a deadlock (Glanville 1996, pp. 453-455). The fourth dialogue is like the first where there are immovable parts that keep the dialogue stagnant. The third scenario where there is a free-wheeling conversation describes the ideal dialog between the designer and the client. It is also where Bohm's dialog could be effective in developing and maintaining.

There are aspects of Bohm's dialog and communication that can be integrated into an ideation tool that could achieve what Woods calls solutions 'without prior truths' (Wood 2008). Bohm and Peat have explored the importance and connection between creativity and communication together in *Science, Order and Creativity*. More specifically in *On Dialog*, Bohm explores 'the possibilities of dialogue transforming not only the relationship between people but even more, the very nature of consciousness in which these relationships arise[1]' (Bohm 2007, pp. xx) and therefore is a key tenet within EiDOS. This research defines communication as a dialogue or "to make something common," (Bohm 2007, pp. 2). The ability 'to make something common' is important and not determined as either verbal or visual. If the client and designer define which method works best for them an existing debate can be avoided. For example Gunther Kress who considers which modes of communication whether verbal or visual modes of communication are more effective. Schön states there is little reason to differentiate between visual and verbal because for him they are parallel ways of designing. I do however positively affirm Doloughan's comments regarding the 'privileged position' of verbal communication. The position of verbal communication can impede understanding the semiotic potentials of visual communication and its role in cognition, representation and communication (Doloughan 2002, pp. 59). Language as a part of a reflective practice of design can consider the meaning in language that is both verbal and visual because each design situation can be different. Bohm has stated that he had developed his guidance to work within larger groups (20-40) but given the state of communication between the client and the designer and their impact at this point in the design process it is asserted that the design process and ideation in particular would benefit from his ideas if they allow for more effective and creative ideation.

Bohm discussed habits of thought and dialog we practice consciously and unconsciously that may inhibit dialog to produce dialog. I limit my inquiry to three that he mentions in On Dialog. Suspending assumptions is important but not self-censorship, it is not important to change any assumptions but to be aware of them. There should be an awareness of our own assumptions that cause us to react emotionally. Awareness within the dialog (self and others) can help create a mirror of our reactions (emotional and physical) in other people so we

are in touch with the views of others in the dialog. 'Absolute necessity' is discussed within the context of questioning which aspects of the dialog are necessary and doing this in a literal fashion. Proprioception (self-perception, to see the consequence of your own thoughts) leads to a collective participation. As an outcome, which is not guaranteed or trouble free a favourable outcome is a dialog where the dialog doesn't not analyse things, win arguments or exchange opinions, but rather to suspend your opinions and look at the opinions -- listen to everybody's opinion, to suspend them, and see what all that means (Bohm 2007, pp. 30).

There are a few challenges within Bohm's framework. Bohm describes desired cognitive and personal characteristics (self-perception and emotional awareness for example) of the participants in the dialog but they can't be measured or verify that they have been implemented correctly. The other difficulties are that Bohm's dialogs are made for groups over 40 and the dialogs are developed over months and years that are not tenable. Lastly, as much as I would like to administer his dialog in the way that he would or a trained professional, I can't. In reading his book, I can glean some concepts but there is a chance they are misrepresented or misinterpreted. This is what I mean by Bohm providing a foundation, having an ideation tool based on his approach to dialog or a starting point. The ideation tool is not meant to represent or replicate his method. I would like to address 4 points in this research.

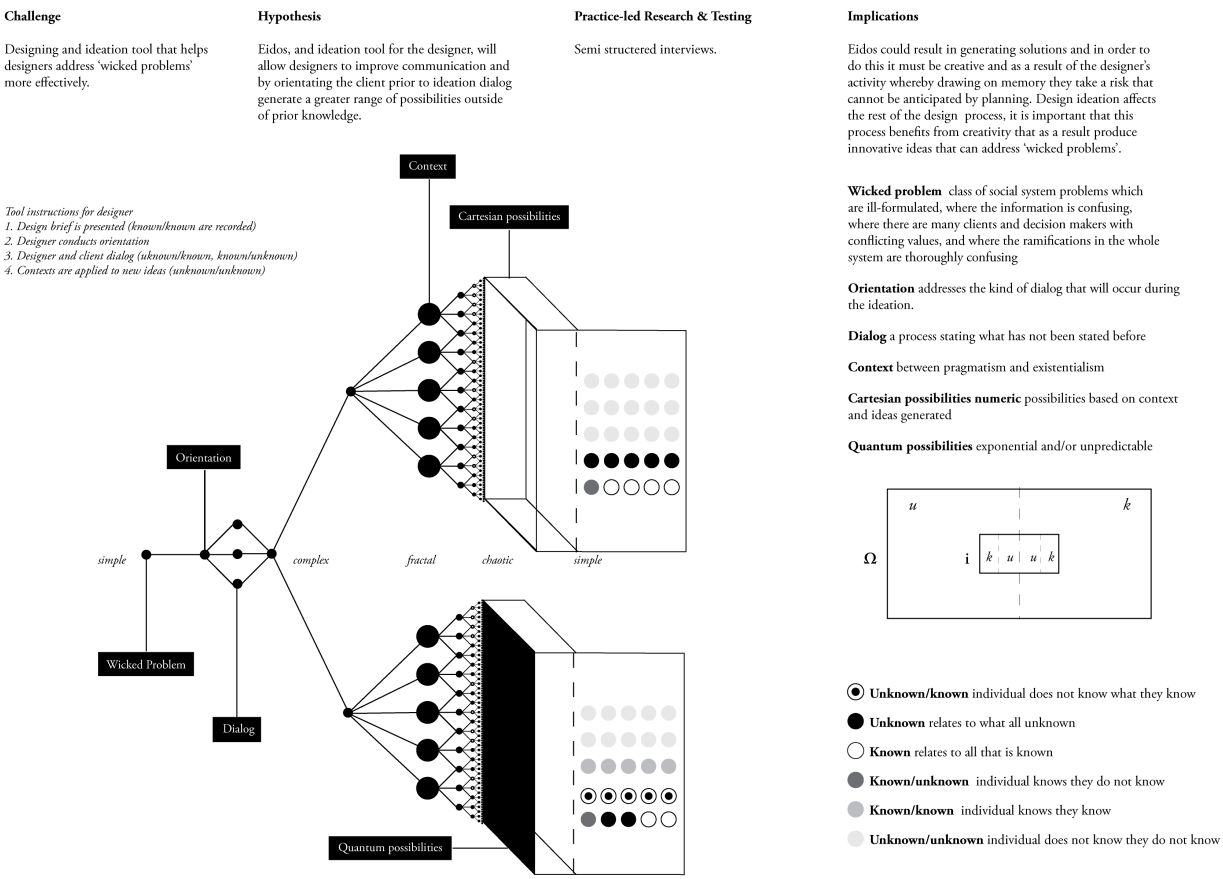
1. The designer will not declare anything to do. (Bohm 2007, pp. 19)
2. There is no attempt to gain points, or to make your particular view prevail over the other participant, therefore the designer is not in charge of the dialog, he/she must be able to let it evolve. (Bohm 2007, pp. 7)
3. The designer rand client will suspend their opinions and instead stating the other participants' opinion (create a listening and awareness of the other's opinion)
4. The designer and client are making something in common, i.e., creating something new together therefore each person does not attempt to make common certain ideas or items of information that are already known to him. (Bohm 2007, pp. 3)

What evolve from Bohm are 4 principles. These core ideas will be at the center of a designer's guidance for the ideation phase as a matter of orientating the client before a dialog begins. Black writes that the influence of the client is not necessarily harmful; in fact the opposite is often true. When the client and the designer are in sympathy, the can produce better work than that of which either alone would be capable (Black 1999, pp. 110). In the absence of cooperation Bohm writes that clashes and conflict are inevitable when each man in each group acts in a particular and independently determined order (Bohm 1968, pp. 144). While creative group collaboration is recognized as being beneficial, there has been little emphasis placed on the role of the designer as a facilitator of ideas and communication. Ideation tool development and research reflects a cultural migration to computer and technology based solutions and interventions. The potential of the designer and the client creating new and novel ideas warrants closer attention because the benefits also include improved

communication but also a potentially unexplored wealth of collaborative ideas.

Context

If we refer back to the goal of the research for addressing complex design problems that are comprised of components whether they be many or little, non-linear components and they have dynamic interactions that are changing over time, have no resting state at which they fall into equilibrium and the components will not have enough information to address the whole problem because there is a lack of awareness between the components and between the components and the whole system then the ability to understand the different context becomes critical to understanding the problem. Context for this research is critical looking at the problem from different perspectives that extend beyond the immediate experience of the designer and client (Heskett 2002, pp. 8). This research uses context to describe two conditions. The first was mentioned in defining the idea and those were the major philosophical contexts in when we design: pragmatism, existentialism and probability. These contexts affect every design and the philosophical context in which we view ourselves in western culture. The second is the context that is recognized as a characteristic of complex design problems such that they cannot be approached through one component, other components need consideration as well, that includes context. Bohm and Peat recognized the problem of addressing context within science because 'science today is becoming more and more specialized so that an individual scientist may spend a lifetime working in a particular narrow field and never come into contact with the wider context of his or her subject' (Bohm and Peat 2008, pp. 19). They go on to state that this fragmentation where scientists hold on to their tacit skill and knowledge even when their application may be inappropriate or irrelevant (Bohm and Peat 2008, pp. 21). This relates directly to the design situation where Buchanan stated that 'designers and members of the scientific community tend to leave little room for reflection on the broader nature of design and its relation to the arts and sciences, industry and manufacturing, marketing and distribution, and the general public that ultimately uses the results of design thinking. Instead of yielding productive integrations, the result is often confusion and a breakdown of communication, with a lack of intelligent practice to carry innovative ideas into objective, concrete embodiment. In turn, this undermines efforts to reach a clearer understanding of design itself, sometimes driving designers back into a defence of their work in the context of traditional arts and crafts. Without appropriate reflection to help clarify the basis of communication among all the participants, there is little hope of understanding the foundations and value of design thinking in an increasingly complex technological culture (Buchanan 1992, pp. 8). Buchanan, Bohm and Peat propose the most relevant arguments for considering context no only as it relates to our skill set, the academic culture of specialization but also in reflection to the growing complexity of the world we design in.



This diagram was the first iteration of EiDOS. The over all scope was that if a client and a designer were to work together and generate three ideas, one from each of them and a new idea they both generated that if they applied context that there was at least a mathematical possibility that they could produce 253 (3 ideas x each of the 5 contexts). This diagram treats the ideation phase as an algorithm and as such explores the feasibility of the steps. This drawing illustrated the steps going from wicked problem, orientation, dialogue, and context. At this point they are separated into two perspectives. The top branch labelled *Cartesian possibilities* is a literal interpretation of the 253 ideas as a product of the initial ideas times the contexts. Within those ideas are a set of ideas and an arbitrary breakdown regarding how they might occur. The *Quantum possibilities* were an alternative to a Cartesian perspective. The quantum possibilities were by definition better adapted to account for the phenomena of creativity and as an occurrence during the process creativity could be described in other than predictable terms. It could be sufficient then to describe the process as something happening, but not be drawn into a debate regarding how exactly it culminated in ideas. This could be different from *Cartesian possibilities* in that since we know how many ideas we are taking into the process and the number of context, we should come out with a predictable outcome. At the same time 253 ideas might be generated, it could also yield 1 idea or 1,000, but through the process the goal is to increase the ideas labelled unknown/known ideas. These ideas

would describe the ideas the client and the designer were not aware of before engaging in the dialogue. It serves as an illustration that this research does not attempt to describe the creative process, but to illustrate that 'something' does occur and through the prior process of orientation, generating 3 ideas through dialogue and applying context, something happens and this was a preferred outcome.

Increasing the amount of ideas generated during ideation also increases entropy or the amount of information produced in the process (Gray 2009 pp. xiv)[xxvii] by incorporating orientation, dialogue and context.[xxviii] During a seminar I described the design process as chaotic, emergent and unpredictable. A senior member of staff questioned this and proposed that design was not unpredictable, that you can start out with a purpose and see that purpose fulfilled. The view of design as a purposeful activity and an activity that can control outcomes highlighted my inspiration for proposing a counter argument describing design as a creative process, a risk taking process that can transport the client and the designer to a new solution space. Based on the prior chapter of incorporating orientation, dialogue and context, the components of ideation tool were conceived to generate possibilities with the client. Although the benefits of generating more ideas is compatible with the development of creative ideas it can be in direct contradiction of ideation tool methodology to develop solutions based on the design brief in an efficient and timely manner. Design needs ideas and deferring as to whether ideas are creative or that they are good, the point is we need more ideas and I am generalizing entropy as a justification for generating more ideas. Bohm and Peat defined entropy as 'a measure of the change in the range of fluctuations that occur within the random order' (Bohm and Peat 2008, pp. 139) and Cilliers provides a definition that 'entropy can be seen as a measure of the 'disorder' in a system. As a system transforms energy, less and less of it remains in useable form, and the 'disorder' in the system increases' (Cilliers 1998, pp. 8) but within this research neither definition is going to accurately help us understand how generating more ideas can provide information that can help address complex design problems. The conditions in which entropy applies are such that we are not generating random information but information that tells us more about the complex problem and provides resources to address it. This way of thinking about information is in contrast to a design process that is controlled and where the first idea or a previous idea can be used for multiple complex problems despite their usefulness or relevance. As an example, if two designers are given two coins each and these coins say something about the design project. Designer A has a coin with heads is on both sides and designer B has heads on one side of the coin and tails on the other. Which designer has more information in order to address the design problem? The actual information for this research are the ideas that are generated an in response to the client led process and design briefs that may not address the actual design problem, I am suggesting a less focused approach on the design outcome and a more concerted effort in generating ideas that can tell us more about the design problem.

If we look at the design process as being instantiated by a design problem, a proposal to solve the problem and a process in which this occurs efficiently it would seem successful and optimal, but for complex design problems, the problem would need to be engaged before formulating a solution. To go into it with a solution is akin to Bohm's idea that the tacit skill and knowledge may be irrelevant. As a process designers can claim that they

exhaust the research process in order to develop a solution but we have reviewed two major obstacles that are that they are working in a client process and that they often succumb to mental habits.
I propose that Shannon's entropy can be used to philosophically justify the need for generating more ideas in which to address complex problems. What this research focuses on is the notion written by Gray.

> The second notion of information used by Shannon was mutual information. Entropy is really a notion of self- information the information provided by a random process about itself. Mutual information is a measure of the information contained in one process about another process. While entropy is sufficient to study the reproduction of a single process through a noiseless environment, more often one has two or more distinct random processes, e.g., one random process representing an information source and another representing the output of a communication medium wherein the coded source has been corrupted by another random process called noise. (Gray 2000 pp. xiv)

There are two main ideas, the first is that the act of generating ideas can provide more information about the design problem and the result of generating ideas can increase the amount of creativity used to address complex problems. If we have an ideation process with one possible outcome or an ideation process with 1000 possible outcomes, it speaks about the design problem as much as the ability to engage it.
Entropy and Shannon's entropy have been used as tools in design ideation research. Kay and Gero used Shannon's entropy to interpret Linkography (Goldschmidt 1990) results. In this case he is using Shannon's entropy to determine the amount of information carried by a message or symbol, in this case Linkography clusters of when decisions were made impacting the design process, based on the probability of its outcome. If there is only one outcome, say by flipping a coin with two heads then the outcome is known and the amount of information is 1:1 but if the coin has heads on one side and tails on the other rather than the uncertainty or new information is increased 1:2. Linkography is another type of protocol analysis so assess the designer productivity by decomposing the designers activities into 'design moves' or 'a step, an act, an operation, which transforms the design situation relative to the state in which it was prior to that move' (Goldschmidt 1995) (Kan and Gero 2007; 2008, pp. 316). The designer's productivity is not at issue for this research nor is the quantification or definition of design links because the assumptions for this research of what constitutes a link is irrelevant and could lead to a misinterpretation based on the researcher's own intention. Unlike Linkography, the premise is not to measure the steps or links but to generalize a different approach to complex problems by looking at the ideas that are generated differently and with that recognizing the value regarding what they say about the design problem as much as they lead to opportunities in developing complex design solutions.

The ideation tool is designed to generate greater possibilities therefore descriptions of the ideas are defined by using Set Theory to characterize the ideas of interest within the set of possibilities.

The last section highlighted the benefits of generating more ideas, but within the set of ideas are subsets of interest as they relate to the ideas that emerge from the client and designer interaction during dialogue. Set theory is being used to characterize the ideas generated by EiDOS and a subset of ideas that are targeted. 'The Idea' has been defined for this research, but in connection to the ideas of interest, set theory offers a context in which to also describe ideas. Set theory offers a generic way of characterizing ideas. The first set is the set of all ideas that is represented by Ω. Ω is not recognized an element of Ω and 'Russell's paradox is recognized that the set of all sets not members of themselves both is and is not a member of itself therefore we cannot define sets precisely as we wish' (Monk 1969, pp. 12).

Hausdorff provides a framework in which to describe my set of ideas by changing the values of the set (Hausdorff 1962, pp. 12-13). The set of Ω includes what is Known (K) and what is Unknown (U) such that it is an open interval (U, K) since the interval is infinite in either direction. If K and U are two sets, then the question arises whether the elements of one may not belong to the other. If *k* and *u* denote elements of K and U respectively, then we first consider the following two pairs of alternatives (ε signifies 'are a part of'):

1. Every *k* ε U and every *u* ε K: K=U;
2. Every *k* ε U and not every *u* ε K: K < U;
3. Not every *k* ε U and every *u* ε K: K > U;
4. Not every *k* ε U and not every *u* ε K.

From this set further subsets UK, UU, KK and KU:

1. UK - not knowing what you know. (Ex: remembering a place or thing and the 'tip of your tongue' situations)
2. UU – not knowing what you don't know. (Ex: this cannot be illustrated because if we knew what we didn't know it would be KU)
3. KU – knowing that you don't know (Ex: not knowing the origins of the universe or the entire DNA sequences of all the dinosaurs)
4. KK – knowing what you know (Ex: your name, place of birth and favourite food)

Conceivably because our knowledge changes over time affecting what we know, what we knew and what we forget, the relationships between what we know and what we don't know can be further delineated.

1. KKU - knowing what you know and when you didn't know

2. UUK – not knowing what you don't know when you knew
3. KUK – knowing what you don't know when you knew
4. KKK – knowing what you know when you knew

In short hand we can simply state the subset is a set of intervals (Ex: UUK, KKU, UKUK...) in either direction of K and U therefore the set can also be described as (-∞, ∞) within the context of change over time. This research assigns different ideas to different stages to the EiDOS, in that during the first stage where the client and the designer read the brief and write down their ideas they are stating what they know or KK. The second stage where there is an orientation, there is no idea that is written down. The third stage where the tenets of dialogue are described and the client and the designer are encouraged to generate and idea together this is labelled as generating and idea that they do not know they don't know or UK or where the client don't know what they know. The fourth stage is the application of context to generate more ideas and this is labelled KU, or ideas that they know they don't know. It is assumed that there will be cross over within and around the types of ideas that are generated given exposure to a new design brief, a new day or some other impact or experience. What is most important is the focus on UK or the ideas that the client and the designer know they don't know or what could be considered a new synthesis. The UK will be described as creative or innovative based on the new synthesis and risk taking characteristics.

The actual data needs to be explored in more detail at this point. As it relates to EiDOS and the key aspect of developing new ideas by improving communication, there must be a level of clarification regarding what new ideas mean in terms of this process. This alludes to the intention of having the participants write down ideas on different coloured Post-its during the design activity. There were 5 steps where ideas were specified to be recorded written down. The first being the ideas written after the brief is read. This is done so that an idea of the ideas they are bringing prior to engaging each other are recognized. The second step was after an orientation that was aimed at realigning the client and designer as equals in this process. The third step was after a description of the type of dialogue they would engage in. The fourth, fifth and sixth, were after they applied each type of context (pragmatic, probabilistic and existential). The order of the process is in tandem with the type of ideas that I am hoping to achieve. These ideas are attributed to applying set theory to the generation of ideas such that a more specific way of describing ideas becomes more appropriate.

EiDOS an algorithmic ideation tool for designers to navigate the ideation phase with their client was presented at The Big Picture (2008), Glasgow University (2009) Oxford University (2009) and applied during a consultation with Creative Lewisham (2008).

I presented powerpoint with tenets (orientation, dialogue and context) for an ideation tool were presented to The Big Picture (2008) and were then included during a consultation with Creative Lewisham (2008). The presentation and the consultation occurred in the same day. The meeting with The Big Picture was arranged through my manager at Symbian because he had an interest in my topic and wanted me to get as much exposure and feedback as possible. The consultation that occurred later that day was in response to an advertised position I was initially going to apply for but upon further consideration of the design brief I contacted the manager and suggested that I could help for free in developing their approach to get the best results in designers.

My presentation at The Big Picture and the subsequent conversation lasted approximately 2 hours and provided insights regarding their scope in proposing ideas, process of generating and developing solutions and how their client contributed. The Big Picture (www.bigpicture.co.uk) conducts design research company specialising in global qualitative design research. I presented the problem as I saw in being ineffective approaches to complex design problems and my proposal for designing a tool.The ideation tool would use dialogue and context in order to generate more possibilities with the client in order to develop a more effective solution without alienating the client or designer. The goal was to facilitated shared ah-ha moments between the client and designer to provide more effective solutions.

She responded during and after the presentation regarding their approach, complexities of generating solutions and how they conducted their ideation. She stated that their ideation was a bit different in that their eureka moments were experienced alone and that it was only after 'they'd gone through two or three rounds of internal assessment with a lot of different people' would they share ideas with them (Appendix, The Big Picture transcript, pp. 255). They worked with the brief and positioned themselves to work creatively within it (Appendix, The Big Picture transcript, pp. 253). The ideation phase and their ideation was not the beginning of the design process but their process in particular after they have reviewed the design brief. This was also a process that was not conducted with the client and the client was perceived as having the power and the final say. She also stated that since they were positioned with global partners specific complexities arise that included dealing with different cultural perceptions of solutions and the problem. This also extended to their perception of their role and relationship with the client where she stated they were subservient or that the client always had the last say on solutions. She was much more concerned with the relevance of the tool because she saw her job as being much more tangible on results and exploiting new markets not the process of ideation as being product driven.

Taking the presentation and her feedback into consideration, I was surprised that the process of generating ideas was as disconnected from the client. Given her statement that 80% of the ideas she proposes will not be considered, I could imagine incorporating the client more so that those ideas are considered. Since the client developed the design brief it might be reasonable to believe that ideas outside of the brief would need their approval and the best time might to get that buy in was at the beginning of the process, not when they have bone away to develop solutions. The design process and the ideation process are considered very different processes in this practice.

The presentation informed my consultation with Creative Lewisham. I met with an employee after my presentation and she described her project which was to develop a web site that had to be developed to capture specific types of information. When she showed me the list of designers who had made proposals, I took her to their websites. One design house in particular had developed solutions using a template where the type, use of pictures and layout was similar for all their clients. I mentioned that the project was unique and should be engaged first and from there creative and unique possibilities could be generated so that neither of you are stuck with ideas that don't apply. The designer could have made a pitch regarding how their designs can be applied to the clients project, but they would be hard pressed to describe their web site as a solution for the client not merely applicable to their project.

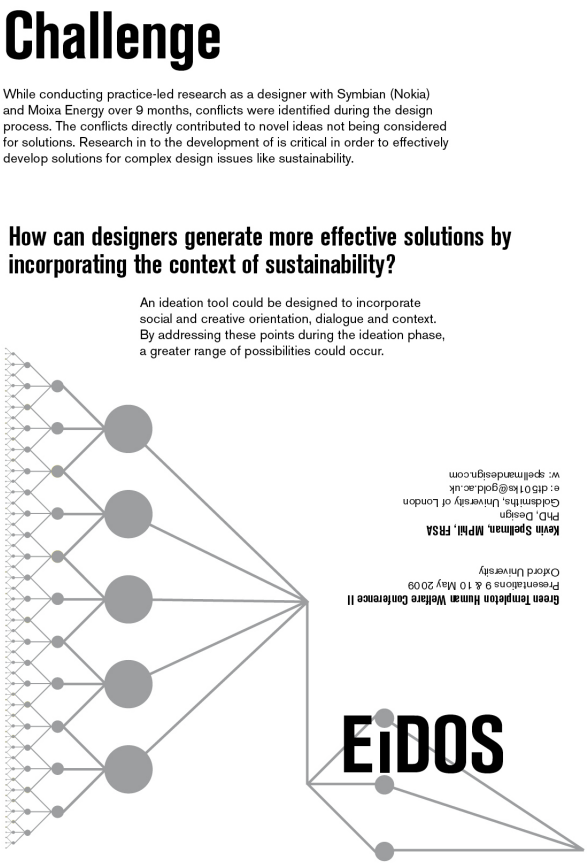
Presenting EiDOS at Glasgow and Oxford University extended the research beyond Goldsmiths into the wider academic community and provided a formal platform to apply, examine and discuss with other professionals who had no prior exposure to the research. When EiDOS was formalized as an algorithmic design tool, I applied for two conferences at Green Templeton, University of Oxford and Glasgow University and both abstracts were accepted. On May 9th 2009, I presented EiDOS as a tool for sustainability at Green Templeton at Oxford University, for the Human Welfare Conference II: " 'Globalisation' and Human Welfare: Innovations in Sustainable Solutions". At the University of Glasgow I presented a paper on the 9th June 2009, for the 7th annual Conference of the Graduate School of Arts and Humanities Communicating Change: Weaving the Web "Exploring the notion of change within individual fields and across interdisciplinary fields." The paper entitled 'How can designers develop communication that effectively addresses 'wicked problems' in design?' explored dialogue within design as a focus for new innovative methodologies. The paper and poster presentation were an opportunity not only to share my ideas, but to also receive constructive criticism from my peers and judges. The conferences exposed me to different methods of presenting information, current academic topics of research and exposed relevant areas of overlap. The attendees of the conferences were from diverse backgrounds and areas of study mainly within the field of social sciences.

The Oxford University conference was significant because they provided the first platform for presenting EiDOS as a designer's algorithmic ideation tool to non-designers. The abstract and poster presentation needed to speak to an audience on two levels. One they would have to see a benefit in the tool and they would need to access it meaning it would make sense to them and I should be able to explain it in a short amount of time during the poster presentation. The following is the abstract from the presentation.

> I will present a poster that combines philosophy, practice-led research and empirical knowledge that will substantiate how the context of sustainability can be applied during design ideation. Sustainability or "development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland 1989, pp. 784) is an essential ideation context for addressing human welfare. The effectiveness of sustainable solutions are critically affected by early decisions in the ideation stage (Thackara 2007, pp. 1; Goldschmidt and Tatsa 2006, pp. 593; Vygotsky 1998, pp. 6; Bateson 2000, pp. 229). Ideation, a method of generating, developing and communicating ideas, where 'idea' is understood as a basic element of thought that can be either visual, concrete or abstract and is an essential part of the design process (Broadbent, in Fowles 1979, pp. 15; Jonson 2005, pp. 613). Design is an essential part of the general process of innovation. Effectively addressing sustainability within design ideation is difficult. Creativity and ideation/ideation tools can be narrowly defined and may not adequately address contexts like sustainability that are inherent within complex problems. Incorporating levels of contexts during ideation can result in generating more effective possibilities for addressing sustainability.

A full paper was not requested for the poster presentations; therefore the abstract, poster, handout and

presentations were produced. The following folded flier was designed as a take away to provide information about the research and contact details.



The concept for the poster was to create a vehicle that provided a narrative to go from an existing condition through a familiar metaphor, in this case the underground to the benefits of an ideation tool. The theme of the poster was about two distinct journeys. The first journey was the central line, it was the current method of ideation where the client and designer start at one point and with the help of a brief and a desired outcome they go about their journey and arrive safely at the other end. I proposed that there were two problems to this issue; the first is that some design problems like sustainability are not clear and that there are more considerations that can change where you are going and how you get there. With this in mind, I offered an alternative. With my tool the designer and the client have a problem, then they engage each other and through this dialogue they acknowledge their own ideas and they generate one together, something they may not have seen before. At this stage they will generate other alternatives by applying different pragmatism, probability and existential contexts. At the end of the process they have explored a range of solutions and have examined the problem in such a way as to provide a more effective solution together.

The format of the poster competition was that the posters would go up the night before and allow judges and other attendees to view them. The following day all the presenters would stand by their poster and present the information to anyone who came by in addition to the judges. Their questions varied from their initial impressions that the research was about the underground, ideation tool accessibility, trademark ideation methods, the 'real' impact to everyday applications to patents. The main themes were 'How does it work?' and 'How do you protect this method of generating ideas?' This was in contrast to the peer critiques, supervisory sessions and even other academic associates who had prior knowledge of my research. When I presented to the judges they asked was what kind of design this tool referred to i.e. was this architect, interior, graphic or product design and asking for practical examples followed up that question. For the first question, I provided a brief explanation stating that since the ideation tool helped guide the client through the design process and catalyse or inspire ideas, so it could be applied to any area of design. More importantly than the area in which it is applied is the nature of the problem. The value in EiDOS can be more easily understood when it is applied to a brief for an environmentally sustainable car. The brief states the problem of filling a gap in the market and also the result, which is an environmentally sustainable car. In order to build an environmentally sustainable car, there are many considerations like the customer, the car design, materials, cost, environmental impact (short and long term) and energy sources. This level of complexity would benefit from EiDOS because it takes the client and the designer beyond the brief to important considerations that will enable them to more effectively formulate a solution.

The 7th annual Conference of the Graduate School of Arts and Humanities entitled Communicating Change: Weaving the Web into the Future held at the University of Glasgow going from the 8-10th June 2009 was an opportunity to apply EiDOS as an ideation tool that could facilitate communication. The full paper is provided in the Appendix. The following is an abstract that was presented for the conference.

> The design process can be a flexible and creative process able to address 'wicked problems' yet academic methods and ideation tools are not effectively guiding creativity. As a result creativity is seen and formalized as a means to an end. 'Wicked problems' or a "class of social system problems which are ill-formulated, where the information is confusing' need creativity because as Buchanan states design problems are "indeterminate" and "wicked" because design has no special subject matter of its own apart from what a designer conceives it to be (Buchanan 1992, pp. 15, 16).
>
> Ideation significantly affects the design process and therefore creativity during the ideation phase has a critical impact in generating solutions. Margolin has stated that the 'power of design is in conception and planning…' (Margolin 1998, pp. 87) The conceptual phase or design ideation can be seen as a matter of generating, developing and communicating ideas, where 'idea' is understood as a basic element of thought. Ideation is an essential part of the design process (Broadbent, in Fowles 1979:15) (Jonson 2005, pp. 613).

> While I do not advocate a formulaic or probabilistic approach for addressing ‘wicked problems’ I am suggesting that a closer examination of ideation methods is necessary to address a paradox that exists between current design methods of delivering novel or innovative outcomes based on the design brief deliverables and the creative process necessary to address and deliver solutions for ‘wicked problems’.

The presentation was made within a small group; therefore it was conducted as more of an open discussion that lasted 23 minutes. I began by describing what I saw as an opportunity in developing solutions to complex problems by describing current pragmatic approaches and the necessity of an ideation tool given the complexity of specific design problems and I again used the example of an environmentally sustainable car. I then suggested a different approach. There were no posters or graphics to take the audience through. There were three questions. The first was regarding the example of a sustainable car and that there were no boundaries on what I meant by sustainability i.e. could the goal really be to be more sustainable? I responded to this question by stating the paradox between sustainability as the Brundtland Report and economic sustainability define it. The other two questions were regarding an uncertainty regarding the terms 'wicked problems' and complexity. I responded by using Rittel's definition of 'wicked' and Cilliers definition for complexity. The overall feedback was good and was complimentary for the proposed practical use. The presentations were ideal situations where I felt based on research and practice that EiDOS could be an effective tool, therefore testing was the next logical step.

How can designers generate more effective solutions by incorporating the context of sustainability?

Green Templeton Human Welfare Conference II

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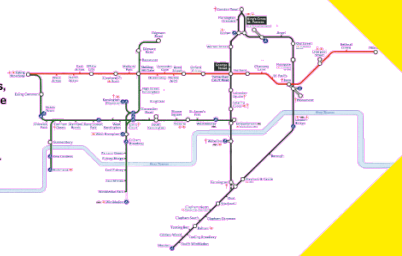
Challenge

While conducting practice-led research as a designer with Symbian (Nokia) and Moixa Energy over 9 months, conflicts were identified during the design process. The conflicts directly contributed to novel ideas not being considered for solutions. Research in to the development of is critical in order to effectively develop solutions for complex design issues like sustainability.



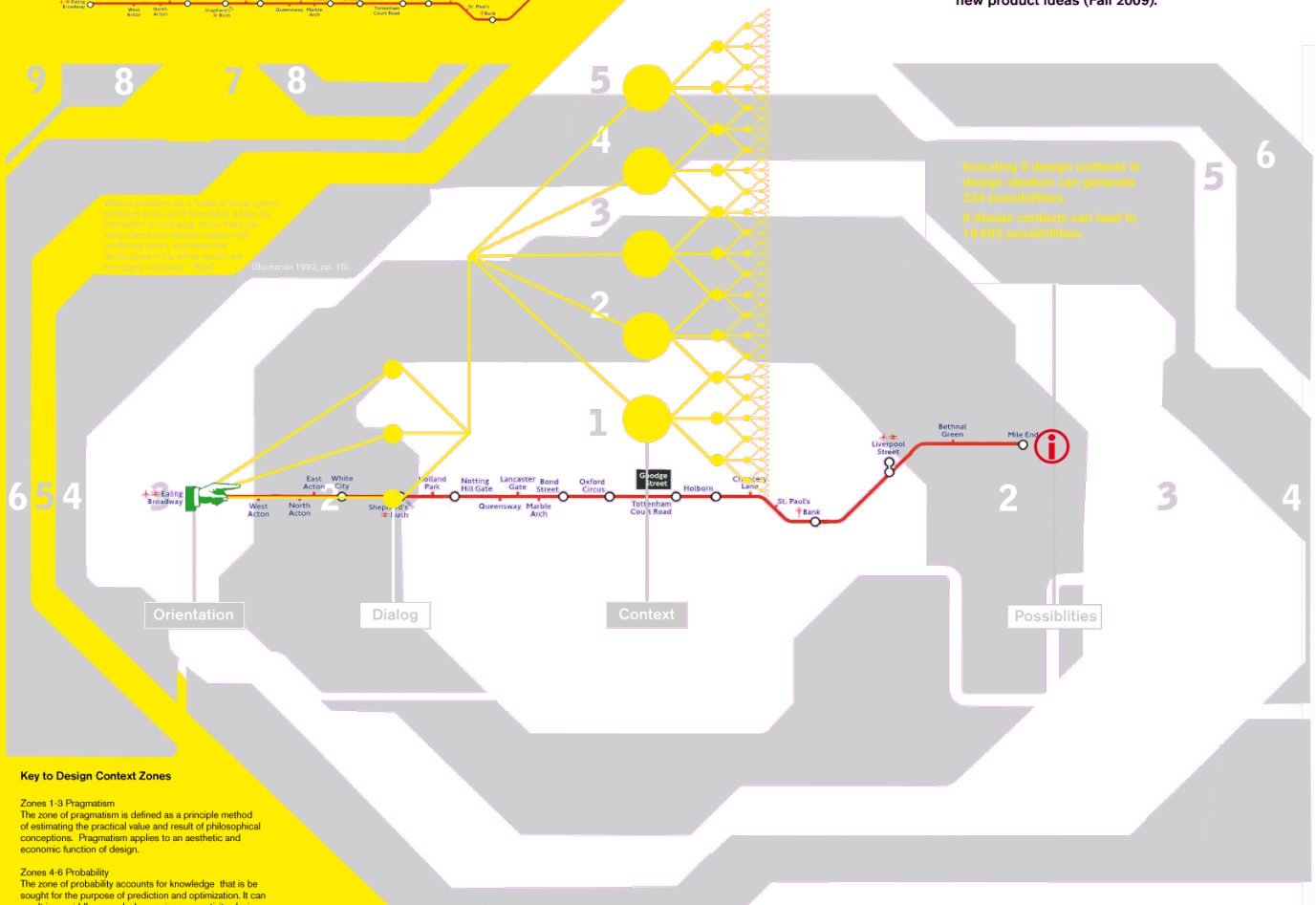
Example of an ideation approach: Central Line
A strategic ideation approach that can start by exploiting a new market. There is a clear goal and the end design reflects little variation or creativity.

Hypothesis

An ideation tool could be designed addressing 3 specific points: social and creative orientation, dialog and context. By addressing these issues during the ideation phase, a greater range of possibilities without prior truth should occur.

Practice-led Research & Testing

Practice-led research and protocol analysis are effective methods for generating and analyzing design practice and ideation. This tool will be tested at Goldsmiths by matching designers and product managers in a studio setting to generate new product ideas (Fall 2009).



Key to Design Context Zones

Zones 1-3 Pragmatism
The zone of pragmatism is defined as a principle method of estimating the practical value and result of philosophical conceptions. Pragmatism applies to an aesthetic and economic function of design.

Zones 4-6 Probability
The zone of probability accounts for knowledge that is be sought for the purpose of prediction and optimization. It can result in a middle ground where science, creativity, design and business can compromise in order to develop an optimal solution.

Zones 7-9 Existentialism
Existentialism emphasizes 'distinctively human realities' so that 'to even speak of a subject and object as distinguishable entities is to presume more than can be known'. Existentialism highlights our ability to engage 'wicked problems' like sustainibility.

Key to Symbols

A starting point that can occur in any context. For this map the context is within pragmatism where design has been most active over the last 30 years as a tool for economic growth.

1 This represents zones of context that may be present during ideation.

This represents a point in the ideation phase where the ideas are taken into the process of development or the ideas are further defined.

The possibilities are fractally represented here, but they can also be infinite. Dialog is one recognized method of generating creative and innovative ides.

Key to Contexts

Orientation Orientation for the ideation phase is very important given the impact the ideation phase has on the rest of the design process. It sets into motion our ideas and our intentions. Orientation specifically addresses the kind of dialog that will occur during the ideation. It allows the designer to orient the client and themselves to communication that will develop into something new.

Dialog Dialog is recognized within design and design reserach as an opportunity to develop creative and innovative solutions between two people. Some key attributes for dialog include each party being able to let the dialog develop without trying to control the outcome or develop a to do list during the dialog. Dialog in essence as David Bohm has stated is to develop something that had not existed before.

Context Creativity has been defined within product and marketing reserach as an ability to generate solutions within finite design contexts, but creativity benefits when it is not object oriented for design outcomes.

Possibilities Within each new possibility is a solution. It may not be what you had imagined, yet with growing complexity and an equally growing need for innovation predictable and probable ideation approaches will do little to address complex problems.

Implications

More effective for dealing with 'wicked problems' such as sustainability because clients and designers can be focused within the design context where creativity is a business strategy not a process or journey.

The ideation tool will allow designers to improve communication with the client while orientating both of them within ideation to develop possibilities that can be considered equally in tandem with prior ideas.

It should result in generating solutions and in order to do this it must be creative and as a result of the designer's activity whereby drawing on memory they take a risk that cannot be anticipated by planning.

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PROTOCOL ANALYSIS OF IDEATION TOOLS AND DESIGNERS DURING DESIGN ACIVITIES

I will conduct protocol analysis of participants using EiDOS, TRIZ and a placebo to compare the participants' ability to generate ideas, and their experience of collaborative idea generation.

While design problems grow in complexity, the resulting incompatibility of traditional academic demands for knowledge from design ideation research becomes more apparent. From the outset when we speak of design research we are talking about a field of fields where an interdisciplinary recognition is necessary even when we speak generally of research and design or design research. During the 2007, International Association of Societies of Design Research (IASDR) Barnes and Melles provide specific concerns regarding how to navigate multiple research fields while also resolving relations between orthodox disciplinary and non-disciplinary sources of knowledge, including those emanating from design's strong vocational foundations. Academic research historically demands and defines a contribution to research as scientific in nature or contributing to propositional knowledge or knowledge of the facts[xxix] (Neidderer 2007, pp. 6). Research must also provide replicability and extending current knowledge (Glanville 1999, pp. 81; Archer, 2004). The same expectations from design and ideation either in practice or research that predictability or probability is possible for replicability ignores the contradictions between predictability, complexity and creativity. Design and design ideation research face increasing pressure from government, academia and commerce to develop a uniform methodology and a body of knowledge like the field of science (Blackwell, 2008[xxx]; Dilnot, 1984[xxxi]). The pressure can be attributed to recognition that design is important, such that 'it enables us to realize ideas and at the most basic level we need ideas to deal with the world around us' (Brundtland 1989, pp. 784). This pressure is rooted in the purposeful and intention driven characteristics of design where a desire and demand control over complex design processes and their outcomes is a primary function of design. This is what science has promised and in turn if we apply this approach to design the outcome should be the same, control even when divorced from reality (Bateson, 2000; Bohm and Peat, 2000). Ideation tools from this standpoint are perceived as an invaluable opportunity despite significant contradictions since they have a significant role in the generation of ideas during the ideation phase (de Bono 1998; Dorta and Perez, 2008; Metros, 1985; Karni and Arciszewski, 1997). The goal of a uniform design methodology is problematic given a basic argument regarding what design or design knowledge is (Chiapponi, 1998[xxxii]; Glanville, 1999[xxxiii]; Owen, 1998[xxxiv]; Schön, 1991[xxxv]). Nigel Cross has noted it's only since the 80's that design has come into it's own as a form of research and knowledge[xxxvi] while previous design methods can be seen in 1969, when Herbert Simon established a foundation for 'a science of design' (Cross 2006, pp. 3). The science of design follows a history of incorporating scientific methods to design but the replication and uniformity of design methods in practice can be detrimental (Cross, 2001[xxxvii]; Storkerson, 2008; Schön, 1967). As a result and particular for this research, ideation tools and design processes as creative tools and economic tools facilitate a 'strange loop' where the designer and client start and end a complex design process at the same point. Hofstadter defines a strange look

as a paradox, contradiction or phenomenon that occurs whenever you move upwards or downwards through levels of some hierarchical system and unexpectedly find yourself back where you started. (Hofstadter, 2000 pp. 10). While methodologies for the designer can be developed to better address them, all static methods over time will also have to change because complexity and creativity changes over time otherwise neither would have any value either in acknowledging or utilizing within design. Contributing propositional knowledge of design ideation is quite difficult given our perspective but as Whitehead stated 'we can and do know things about the world as it is, for all the contributions of our minds in shaping our perceptions (Whitehead, 1927: passim; 1929:255-79)' (Beardslee, 1979 pp. 32). The phenomenological nature of design ideation (Butler 2007, pp. 1) demands a creative approach almost by necessity since design evolves and relies on creativity and ideation, two functions within a profession that can all share a lack consensus regarding definitions.

I clarify the protocol analysis within the scope of this research is to support more testing and proposals of collaborative ideation tools and that this is a worth while area of study. It is not definitive regarding the outcomes of the tool based on the methodologies. It is like Taguchi, who suggested a fractioneated factorial design between 1980 and 1992 that was initial hailed as a turning point or at least a new ear for statistical design as a tool for new product innovation. What occurred in the 1990's is that after a peer review his methodologies and the underlying statistical methods were scrutinized. This does not take away from the contribution regarding the area of study and it's possible contribution ushering in a different way of using statistical design (Montgomery 1991, pp. 161).

Situating the protocol analysis of the design activity into components of each test, expectations of the test, possible outcomes and desired outcomes aids evaluation (Cross, 2001 and Schön, 1991). Based on the research trajectory, a reasonable question regarding the ideation tool can be presented for evaluation. After presenting EiDOS at Oxford University and Glasgow University included semi-structured interviews conducted between July and August 2009 with a first year BA design student, a third year BA design student, a fourth year PhD design student and Dr. Masouros, a Biomechanical Engineer from Imperial College. The first year design student found the terminology of ideation and an ideation phase confusing. He had no experience with clients at this stage in his education and career and did not understand the need for an ideation tool. The third year design student could understand the benefits of an ideation tool that improved communication and helped to generate ideas. This opinion was based on her experience working for a lead designer where she did not feel her ideas would be considered and that poor communication lead to less effective design results within the design team. She added that the tool maybe useful when she had more control over the design process. The PhD design student found the approach useful but also at odds with her own research goals. She eventually stated that her research and mine were both attempting to identify ideas that could help solve complex design problems, although the tools operated quite differently. Dr. Masouros related to the basic idea of the tool in that engaging clients to generate new understandings and ideas were essential to communicating his research and teaching. He informally incorporated a type of engagement and empathy with his clients, co-workers and

students. Their interviews contributed to the characteristics of someone who would test and therefore use the tool more effectively. Progressing from a formal presentation at Oxford University and Glasgow University and receiving feedback from designers of different levels and non-designers, it had sufficiently progressed to a testing phase.

Expectation

What are some realistic expectations and outcomes of the research and how can EiDOS contribute to that? Can EiDOS help people to generate more ideas than a placebo or TRIZ? These are difficult questions when we consider creativity is an area of control theory applied to the mind that no one has mastered. Apter describes control theory being interested in systems which control themselves towards goals and which may therefore be considered as purposeful. He is concerned like I am about the way in which information is used within a system and between a system and its environment which allows it to achieve its goals (Apter 1969, pp. 258). In very broad and general terms there are three components of significant importance to an ideation, in no particular order. The participant for whom without there is no conversation regarding ideation, cognition or creativity, the ideation tool that interacts with the participant in order to catalyse a desired outcome and the relationship between the tool, the participant and the outcome such that if this tool does this then the participant will do that and the result is a desired outcome. This level of knowledge and control is beyond the scope of the research and quite possibly beyond human capability (Lyon 2006[xxxviii]).

Cognitively based ideation research attempts to addresses how ideation (mental and/or visual) transformation, representation and re-representation occurs and provides tools to describe relationships between ideation tools, cognitive activity and designers and provide further clarification/classification within a problem or ideation space (Dorta and Perez 2008; Visser 2006; Schön 1983; Freeman 2003; Reigeluth et al. 1993; Shah and Vargas-Hernandez 2007). Simon's characterisation of activity of design activity has stood the test of scrutiny but it too has crippling caveats as it relates to testing. 'In his problem-solving approach to design, Simon (1969/1999, 1973/1984) distinguishes two stages in problem solving: problem structuring and problem solving. Analysis, synthesis, and evaluation are examples of another decomposition of design proposed by authors adopting, with more or less profound modifications, Simon's approach to design or, more generally, Newell and Simon's (1972) approach (Lebahar 1983; Akin 1986a, b; Goel and Pirolli 1992; Goel 1994; Hamel 1995; Baykan 1996). However, such stages can be distinguished only in theory as distinct activities: problem analysis and solution elaboration progress in parallel, rather than in separate, consecutive stages. Furthermore, designers constantly generate new task goals and redefine task constraints. Even if they are cognisant of prescriptive models distinguishing analysis and synthesis, designers do not follow them systematically (Akin 1979/1984; Cross 1984; Carroll and Rosson 1985; Visser 1987a; Dasgupta 1989). Authors who analyse design problem solving in terms of 'problem space' and 'solution space' have proposed the notion of 'co-evolution' of these two spaces (Maher et al. 1996; Dorst and Cross 2001; cf. also our idea of problem/solution pairs, Visser 1991)' (Visser 2009, pp. 192-193). This research is firmly situated within 'conceptual research' as opposed to concrete (Ex:

visual attributes) or theoretical/philosophical (Ex: what is good design?) (Roth 1999) and the results could extend cognitive ideation research (Shah 2003[xxxix]; Maturana and Varela 1980; Lecasay 2001; Trimbur 1987; Tseng and Moss 2008; Visser 2009; Suwa et al. 1998). As opposed to a mastering cognitive ideation, I will as Archer states shed some light. '"Shedding light Is applicable in this circumstance where the best or only way to shed light on a proposition, a principle, a material, a process or a function is to attempt to construct something or to enact something calculated to explore, embody or test it. Such circumstances occur frequently in explorations in the useful arts. Such explorations are called action research, defined earlier as 'systematic enquiry conducted through the medium of practical action, calculated to generate or test new, or newly imported, information, ideas, forms or procedures and to generate communicable knowledge' (Archer 2002, pp. 32). It is helpful, with that said, to determine through existing research, resources and interest, realistic and achievable outcomes. Control theory, for this research, is an approach to intentionally catalyse ideation such that ideas are generated and it is implied that increasing ideas increases both creativity and information. Applying orientation, context and dialogue as steps in a scenario and observing any significant changes or differences, in this case the ability to catalyse a breakthrough.

This research builds on the existing premise that during ideation 'something' complex and irreducible occurs (Bohm and Peat 2008; Deutsch 1951; Beardslee 1979). As the characteristic of irreducibility relates to the stages of a design process or more specifically ideation each of the ideation steps are sequential. None of the tests explicitly prohibit iteration. EiDOS is separated into 7 parts, 'Start' (reviewing the brief), 'Orientation', 'Dialogue', 'Pragmatic Context', 'Probabilistic context', Existential context' and a 'Checklist'. The instructions do not indicate an ability to iterate between parts, but iterations within the parts are stated. This by no means infers a control over the designer's ideation not to iterate and may not affect their progression through the process. This to some degree is inconsequential since the whole exercise is that of generating ideas and the parts are there to expand the otherwise ill considered possibilities. For testing purposes, they have instruction at each part to write down ideas only pertaining to each part, therefore there are measures built in. Their behaviour will also be video recorded if they iterate the steps of the test. These activities avoid, to some degree, the need to develop and define design moves since the formalization of steps exemplified by Linkography (Kan and Gero 2008; Goldschmidt 1995), Practice-led research (Pedgley 2007), Co-evolution of problem-solution (Kees and Cross 2001), Framework of reasoning (Horvath 2003), and Characterization (Montgomery 1999) among others[xl] provide characterisation of steps within design and ideation.

A protocol analysis study using a constraint model; a model that modifies constraints as the process unfolds will be conducted for the ideation tools EiDOS, TRIZ and a placebo in order to compare their abilities to generation of ideas (Kalay et al. 1990, pp. 49).

At a minimum, the scenario must give evidence in the form of post-its as an outcome of generating ideas using 3 ideation tools within significantly similar scenarios so that peripheral context can be discounted. The 4x6 inch post-its are being used because they are small and you would not easily get many ideas onto it, therefore there is a better correlation of ideas to post-its when compared to the video where the participant can be seen writing (assume they are writing down an idea). This section will expand upon the justification behind the perfect ideation tool-testing scenario. Protocol analysis has been used widely for analysing design and design ideation (Bilda and Gero 2007; Chusilp and Jin 2006; Goldschmidt 2005; Kan and Gero 2008; Kim et al. 2007) since Nigel Cross (1996) who first wrote about it in the early 90's as a way of analysing design activity[xli] where the verbal accounts of participants thinking is considered data. This research will apply protocol analysis by using video/voice recording to record the ideation activity and the post-it notes are the primary representation of the idea. The participants are not pre-empted to provide verbal accounts of their thinking process, but based on the nature of having two participants during each test, there will be a verbal and non verbal account. With the recordings, their communication will give account to the development of the ideas. The constraint model is used as a way of focusing the testing process by removing unnecessary variables that could contribute inconsistent data. The goal of developing a qualitative method of comparing cognitive aspects of a collaborative design process is similar to the protocol study of linkography (Goldschmidt 2005) conducted by Kan and Gero (2008). They used a protocol study and applied Shannon's entropy to measure the outcome. The main differences between our approaches are that while they recognise the benefits of face-to-face interaction[xlii] they proposed a tool for optimizing idea generation with participants who are not face to face, i.e. technology based ideation tools. This research is strictly for face to face ideation sessions between the client and designer. They are also empirically verifying the correlation between creative qualities of ideas and integration and providing a cognitive ideation research through the protocol analysis. This research utilizes the protocol analysis as a method of recording the communication between the participants, not to develop or hypothesize a correlation between thinking and ideation.

What is not known is if there is a difference or how much difference there is regarding the amount of information produced when comparing these ideation tools. The outcome of the design activity will provide knowledge regarding an ideation tool's active facilitation of a purposeful design approach, benefits of idea generation through communication with the client and a re-evaluation of creative outcomes. The main considerations for an ideal ideation tool/design activity scenario are based on the desired outcomes, methods, participants and implications of the data to highlight the most important aspects and how those aspects could affect the outcome. Generally stated there are 3 aspects of the ideation tool testing scenario: participants, environment and methods.

Participants

Ideally given time constraints and resources, participants would not be necessary in order to observe EiDOS, however this comes at a price. Conducting the design activity either by computer simulation or over existing data would save time, but can a computer simulate 2 people in creative communication and generate creative ideas? Technological approaches to ideation are very popular (Li et al. 2007; Holtta and Otto 2005) but they are not equipped to conduct emergent and creative communication with the client or designer (Mueller 1990; Kalay et al. 1990). While only arguing whether or not this process could be simulated via technology, the main point is the perceived difference between the mind and computer. There are different schools of thought regarding the mind, creativity, communication, probability and determinism as illustrated by cybernetics (Apter 1969[xliii]; Deutsch 1951; Galison 1994; Godwin et al. 1997) and the Turing machine (Penrose 1989; Hofstadter 1979; Anderson 1964) in particular. Is the mind made up of very elaborate bits of clockwork, and that our having 'minds' is simply a consequence of the fact that the clockwork is very elaborate, or that any machine is merely a product of human ingenuity (in principle nothing more than a shovel), and that though we have minds, we can't impart that peculiar feature of ours to anything except our offspring: no machine can acquire this uniquely human characteristic.' (ed. Ross 1968, pp. 2). Although such arguments are essential to consider in light of the growing influence of technology, the ideation tool is foremost a tool for the designer to engage the client, therefore testing it with a designer and client consumes time and resources but also the most relevant.

If we assume that Charles Owen and Nigel Cross are correct in stating that scientists problem solve by analysis, whereas designers problem solve by synthesis then producing contrasting demographic testing is redundant and could only serve to confirm their observational research (Owen 2006, pp. 17 and Cross 1982, pp. 223). It is also observed that while the designer administers an ideation tool, the client is not confined to the role of scientist. As it was preliminarily reviewed with a PhD of mechanical engineering who recognized that cooperative communication for creative solutions was important. As a result of compartmentalizing ideation tools and creative outcomes can be hindered such that the problem solving approach of either the client and the designer are not properly addressed where mental habits and communication need support, but instead a focus on generic problem solving approaches that can inhibit and predict not only the roles but the nature of the participants creative contribution. The participant prerequisites are similar to protocol analysis conducted by Nigel Cross, Henri Christiaans and Dorst Kees (1996 and 2001). The client and designer will have a decision making position will have experience within their industry. They will have a level of responsibility and some communication skills. While both participants should have communication skills, it is acknowledged from the onset that communication conflicts are one of the reasons this tool has been defined, but given that instead of verbalizing the experience like typical protocol analysis to get an idea of the process happening in their heads, the process is considered essential for something to occur in their head. They are generating ideas collaboratively through their communication therefore if they do not communicate it may indicate an early terminus.

Based on prior interviews with students and professionals, designers should have a minimum of 5 years

experience and a maximum of 20 years. Prior to 5 years, the participant may not have a well-developed idea of the whole design process including ideation and they may not have enough client experience to guide an ideation process. If the participant has over 20 years, they are at the same time very mature in their approach, they may be so mature that they guide the process unconsciously and are more selective regarding which aspects of the tool they are comfortable following that alludes to possible mental habits. Given the pool of participants, there will be variations in age and experience but an attempt will be made to keep the age and experience between 1-5 years of experience of each other for consistency.

Environment

Ideally, the environment of the design activity would be conducted in vivo as a paid position with designers, clients and facilitators as part of an existing design project. This scenario has many advantages, but the resources are not available for arranging and integrating into this process and replicating one that includes clients, available designers and proper wages for their work is not possible. Ideally, in either in vivo or in vitro the participants would not anticipate the nature of the design activity as something other than a new design project and they would apply themselves as though they were being paid and would generate as many ideas as they are able. Removing an in vivo environment and anticipating the same results are unrealistic even if both are arguably design activities that provide different platforms for ideation tools.

The environment or the physical make up of ideation tool design activity follows protocol analysis utilizing video and voice recording equipment to capture the ideation session. Post-it notes, pencils and pens will be made available for the participants to record their ideas. The whiteboard or other paper will be removed to avoid redundancy. The post-it notes are representations. They are what Donald Schön has called a metaphor[xliv]. Schön has described similar circumstances with graduates "comes to see a new way" through the use of artefacts in an ongoing process. This process of generating ideas using EiDOS is centred on this principle therefore ideas that seem similar are included as an evolution in the process of making itself as it leads to a new way of thinking (Bamberger and Schön 1983, pp. 68).

Ideally, the design activity would be comprised of 5 groups with a designer, a facilitator and a client making up group. There would be 3 sessions over 3 weeks. This would allow for changes to the algorithm to improve the clarity of the instructions. The design activity has no time constraints because the dialogue is based on David Bohm's work on dialogue, so that the dialogue takes on a life of its own therefore the client and designer would be able to generate ideas till they felt they were done. A 3 person group set up is similar to groups set up by Nigel Cross (Cross et al. 2001), although in his set up the 3 person was an examiner who answered questions and while the facilitator in this group can answer questions, their main goal is to observe the conversation. Bohm has used dialogue with groups number between 20 and 40 max (Bohm 2007, pp. 15), the design activity is for a specific situation of an ideation session and while this situation has inherent difficulties that Bohm tried

to alleviate by having a larger group, the idea that dialogue can help 2 people or 20 generate ideas and new understandings is appropriate. Logistically 20 participants in one group would be difficult to facilitate, is hard to apply to a client and designer ideation and generates and overwhelming amount of data that one person cannot review and analyse quickly. Regarding the voluntary involvement of designer participants there are pitfalls i.e., what do they have to gain by participating? By conducting an in vitro design exercise the role of the designer is exposed as being driven by monetary, creative or other professional/personal gains. The expectation is lessened with students as they are more apt to follow directions and jump through hoops and the algorithm could exacerbate an existing creative issue in their learning (Stables and McLaren 2007)[xlv]. Based on the work and writings of McLaren and Stables (2007), Feyerabend (1979) and Mykheeva (1991)[xlvi] and speaking students because they have not had, as much exposure to the design process can be equal or more creative than their older counterparts in part due to the establishment of mental habits (Dahl and Moreau 2002, pp. 52). It is for this reason older students or students with design experience would be preferred. The more senior (20 years or more of experience) designer on the other hand has mental habits established and this process could be quite uncomfortable. There are drawbacks in either having students as designers or seasoned professionals. Given the pitfalls, it is still preferable that the client and the designer have real experience within their roles. Based on the lack of participants, I have changed the model so that two participants will be used for testing EiDOS, TRIZ and a placebo. This has two immediate ramifications. The first is that they could within the three sessions start to anticipate their outcomes and their partner during the last two design activities. The other ramification is that in observing the participants it can indicate more consistency in the findings as opposed to each new grew getting used to the video and each other. I am aware that the findings because of this could differ if the participants knew each other than if they didn't. Even in an ideal scenario, the client and the designer may have worked together before. If Nike had a design project and had come to associate a demographic with a specific designer who was the best in the field, there would be some familiarity not only with the process but also to some degree the outcome, therefore even though this design activity is not replicating design practice, it does not do so with more expectation than what would be found in practice.

Data

There are 4 resources that will be produced by this research. The first is the number of ideas or post-its that are generated, the second resource is the video of the activity, the third is the questionnaire and the fourth is the exit interview. Weakness in both low participant numbers and meaningful statistical analysis has been written about as a general weakness of cognitive aspects of engineering design (Savage and Miles 1998). Because of the resources available, this research is built on idea generation between the client and designer but not cognitive research as the participants would experience.

The number of post-its generated is effective given the size; the participants will not be able to put many ideas on each one. The research is concerned with the quantity of possibilities generated therefore the post-it count will give an idea of quantity, but not quality. One reason why quantity is important is that each of the tests can

be compared. In order to augment this, the video captures when the participants are writing which is also recorded and can be cross checked against the number of post its for large discrepancies. There is an avoidance to interpret differences between each idea or if one idea is much like the former. They are taken at face value. If they have been written down they are translated as one unit or possibility. Given the nature of the algorithm, there is a mathematical probability that if the designer, the client and both of them generate an idea and several contexts are applied that *x* number of ideas should be generated as a result. This is both logical and problematic. If it was possible to generate idea based in line with the calculation where 3 initial ideas and 5 contexts resulted both mathematically and actually in 234 creative ideas so that they lacked some preconception and were considered creatively equal would be brilliant. Taking a logical approach either probabilistic and/or pragmatic to ideation is both popular and problematic. The designer and client ideally would want a focused design otherwise, but there are two dangers. The first is the underestimation of complexity in that the problem may not be what the brief calls for and the other is an overestimation giving way to a vague and incomplete brief. Probability and pragmatism work in tandem as probability confines solutions through pattern finding, mental habits and ideation tools, it is reinforced by pragmatism or a principle of method for estimating the practical value and results of philosophical conceptions and ideas (Bawden 1904, pp. 422). In a broad sense Voltaire stated that if God did not exist we should find it necessary to invent him. By a similar action we have invented the law of cause and effect with pragmatism (Fite 1914, pp. 413). In short, the approach is similar to taking the best ideas we know because we have seen them before and if we haven't seen them work, then they probably will not.

Based on the goal of designing a focused experiment to examine the effectiveness of EiDOS within time and resource constraints the goal and can be effectively be conducted in vitro. The environment of the ideation scenario is in vitro and in that, similar to ideation and cognition research scenarios (Shah and Vergas-Hernandez 2007; Cross et al. 2001). The design activity will not provide additional data (aside from Moixa, Symbian and Creative Lewisham) regarding in vivo client and designer contexts, but the majority of work in vivo has been conducted and can be readily referred to via transcripts.

Methods

Cross has commented at the general lack of universal methods of evaluating ideation tools or ideation methods especially concerning protocol analysis (Cross et al. 1996 pp. 3). What is more common within the market and research is the self-evaluation of ideation tools or comparisons with their competitors within a limited scope. Quality Function Deployment (QFD) is a measuring tool that is designed within the context of creating organization wealth. QFD originated in Japan is a logistic reference model and method of measuring reference model quality by satisfying the users, 'through the provision of high quality products that fit the users' requirements' (Matook and Indulska 2009). Victor Ross has developed a model of inventive ideation that provides an analysis of ideation tools. He developed three categories based on the evaluation of 27 ideation techniques (ref for full list: Ross, V. (2006) Thinking Skills and Creativity 1:120-129.) His list is not complete

as it relates to ideation tools (post 2006) Dorta, Metros, Jonson and Goldschmidt. Ross also does not include more commercial mind-mapping products (Kokotovich, Santhanam, Leach and Dawson) business strategy techniques (Duggan and Gladwell) or marketing tools. The design and marketing literature suggests several strategies for generating new product ideas, including such techniques as benchmarking (Ulrich and Eppinger 2000), user observation (e.g., empathic design; Leonard and Rayport 1997), lead user analysis (Von Hippel 1986), and analogical thinking (Srinivasan, Lovejoy and Beach 1997). Ross's tool does provide classifications of techniques (number of steps) and mechanisms (i.e. rearrangement of problems or association for example) as a means to compare like for like among ideation tools and techniques. An important development post 2006 is Dorta and Perez and their tool Design Flow. The notion of flow (Csikszentmihalyi and Csikszentmihalyi 1988) studied in other fields can become a pertinent notion to evaluate design tools, this time focusing on the engagement of the designer as it unfolds during ideation. The theory of flow centres on the autotelic experience, or intrinsically rewarding activity. To achieve this, a balance is required between the challenge faced and the person's skills. If the complexity of the activity increases, the flow can be kept by developing new skills to meet the new challenges (Dorta and Perez 2008, pp. 122). This tool for assessing the designer's experience is useful for documenting their experience, not just as fulfilment of the design task. Design Flow is similar in function to Jin and Chusilp who have developed a cognitive activity model aimed at capturing various loops of cognitive activities (externalized through drawing) that is more applicable for understanding ideation methods.

> Both design researchers and cognitive scientists have developed various process models to study human creative behaviour in design. The models developed are often based on observations of design processes and analysis of design protocols. French (1985) developed a model of design process that includes activities of analysis of the problem, conceptual design, embodiment of schemes, and detailing. Ullman et al. (1998) developed a model of the design process based on empirical data. Maher et al. (1996) introduced a co-evolution model that describes creative design process as 'co-evolution' between problem-space and design space. Cross (2000) described a four-stage model of the design process, which is composed of exploration, generation, evaluation, and communication. He also developed a general model of creative strategies (Cross 2000) to describe how exceptional designers solve the creative design tasks. Kruger and Cross (2001) developed an expertise model of the product design process to study cognitive strategies in design. Shah et al. (2001) proposed a model of Design Thought Process to describe generation and interpretation of ideas. Benami (2002) introduced a cognitive model of creative conceptual design to capture interactions between cognitive processes, design entities, and design operations. (Jin and Chusilp 2006, pp. 28)

Shah provides an academic approach for providing modules in order to evaluate ideation generation methods. Shah and Vargas-Hernandez conduct 'Multi-level Cognitive studies in design ideation'. Their primary goal of their joint research between engineering design and cognitive scientists was to produce knowledge needed to not only evaluate idea generation methods but also distinguish between their necessary and superfluous

components (Shah and Vargas-Hernandez 2006, pp. 1-2). Their work provides outcomes and recommendations based on their cognitive study. This is rare within ideation research and could eventually provide comparison with my future findings. They have however used very subjective measurements for effectiveness through fluency, quality, variety, and novelty of design concepts generated (Shah and Vargas-Hernandez 2007 pp. 1). These types of measurements based on the lack of consensus with the definitions could contribute to the fragmentation of meanings and measurements ideation research is based on.

Ideally for this research the best measurement of the ideation tools would be represented by the participants who would be able to design and articulate each idea exactly they are thinking as a pure representation of what they are thinking during every point in the video, voice recorded design activity process in order to develop a more accurate picture of how (or if) the ideation tools affects their ideation and feedback regarding the communication and creativity for each design activity that in general terms can be compared with each other. A cornerstone of protocol analysis is the perception that the participant is saying what they are thinking. Protocol analysis is no longer bound to verbal accounts as it also incorporates video and designers' sketches. Within protocol analysis (visual and verbal) there is an inherent assumption regarding the connection between verbal and non-verbal communication and how it can accurately represent what one thinks and likewise for the drawings or at the very least they say something about each other. The questions regarding the relationships can be insufficiently addressed when you consider Wittgenstein's 'language-games' are a socially constrained pattern of interaction. Words and expressions take on their significance when they are used in a custom-regulated pattern of interaction (or to use Wittgenstein's metaphor, 'the stream of life'; cf. Schatzki 1993; Stern 1991). Language-games do not share any essence; each one of them has its own specific features, rules, and goals' (Kopytko 2007, pp. 794). Caryl Emerson's 'The Outer Word and Inner Speech: Bakhtin, Vygotsky, and 'the Internalization of Language' (Emerson 1983) explores among others like Sapir and Whorf, Trimbur 1987; Emerson 1983; Beaugrande 1998; Clark and Carlson 1982; Li and Gleitman 2001; and Subbiondo 2005, a continuing debate regarding language as a study of language in itself (as signs), language as a manifestation of the individual with varying flavours from inner (mental language), whispering and outer language. Ideation research must actively contribute by acknowledging the growing territory and understanding that language is complex and a level irreducibility between language as a sign and language as a representation of cognition and ideation. It is for these reasons that while the session will be recorded; they are taken in context to the many functions of language and speech so as not to be definitive but a characteristic participant during ideation. Unless these aspects are an integrated consideration, it leaves an overriding dependence on the language without a full understanding of either function or representation. Terry Liddament questioned the relationship between imagery and questioned this one to one relationship (Liddament 2000).[xlvii] A more reflective consideration of limitations concerning verbal and visual meanings should be more actively incorporated within the protocol especially when protocol analysis is difficult to accept as a literal interpretation.

One of the most affective tools for analysing design ideation is through protocol analysis and while this research

is not specifically cognitive ideation it can none the less benefit from the data that is produced while the participants generate ideas using EiDOS, a placebo and TRIZ. For this research, protocol analysis, questionnaires and post-its so the participants can write their ideas down as they have them will be used instead of protocol analysis alone. Questionnaires are useful for developing an idea of the level of communication and creativity. Briggs and Reinig have published work based on the development of Bounded Ideation that compares ideation tools based on the ideas that are generated. The resulting resources will provide supporting information about the ideation tools and the post it notes will provide the ideas generated by which they are being compared.

Prior to the testing, the participants were asked to fill out a questionnaire prior to the first meeting, otherwise it was completed before they tested. The tests were all set up as similarly as possible between testing groups and within the group for consistency. When they entered the testing room they found two envelopes, one labelled client and the other designer with their instructions enclosed, writing utensils, post-it notes and a recording device. The designer had for the first test, an envelope that contained the design brief, designer specific instructions, questionnaires (in their own words and 1-10) and on top of the envelopes labelled 'Setting the Scene' that was a greeting, informal consent (unsigned) and notice regarding how the video and other materials would be used. The envelopes for the second design activity had the briefs and evaluations. The third design activity had the briefs and evaluations and I verbally administered the exit interview. The design scenarios correspond to the design activity so that design scenario 1 is for EiDOS, design scenario 2 is for TRIZ and design scenario 3 is for Placebo. Phase I testing took place on the Goldsmiths campus in a specific design studio. Phase II testing took place in the participants homes and Phase III testing occurred in the participants' studio. The following are the instructions that were in the envelope.

Setting the scene

Thank you for participating in this design activity. You will be participating in the role as either a designer or a client. Before you is an envelope. Before we get to the contents, we should get some formalities out of the way.

1. You are volunteering for this recorded design activity with the full knowledge and expectation that all materials will be used solely for design research. All materials (video, paper, voice recordings) will be used for this purpose only.
2. Please do not discuss any aspect of the project with anyone outside of the test. The reason for this is that there will be other participants and it's important that they are impartial and unaware of the test, otherwise their expectations will affect the outcome.
3. If at any point during the design activity you feel uncomfortable or unwell, please stop the test. It can be rescheduled for a future date.
4. At this point we will start the test.
5. Please share with the other participant a wish list of 10 items of anything you could change about the design process that would make it more creative and what effect you think it might have. The order of

who goes first is up to you.

6. There are no time limits for any part of the design activity so you may take breaks as needed.

Design scenario 1

Company Profile

Ferrari S.p.A. is an Italian sports car manufacturer based in Maranello, Italy. Founded by Enzo Ferrari in 1928 as Scuderia Ferrari, the company sponsored drivers and manufactured race cars before moving into production of street-legal vehicles in 1947 as Ferrari S.p.A. Throughout its history, the company has been noted for its continued participation in racing, especially in Formula One, where it has enjoyed great success.

Competition Theme

"Less is more: travelling in the era of simplicity"

After more than 50 years of uninterrupted growth in terms of performance, weight, power, size, and also price, the growth curve of the car is currently experiencing its first inflections. The culture of "more and more" is over: citizens in developed societies now expect cheaper transport, both in terms of initial and running costs; they are opting more and more for small engines (less fuel consumption); they dream of less impressive models and prefer simplicity of use and design to enhancements in terms of power, design or options.

Guidelines

The designer and client will put forward ideas for an innovative and simple vehicle concept to be manufactured and sold on Western markets. He or she will hold account the current tendency to "always less": less materials, less functionality and equipment, less energy, less wasting of time, less pollution, less environmental impact.

The different aspects of the vehicle to be taken into account are:

Its general aesthetic (design, colours, shapes…)

Its goal (delivery, public transportation, services…)

The types and ways of use anticipated

Its environment integration

Its functional innovations (on-board electronics, ease of maintenance…)

Designer role

You are the designer and have decision-making authority over the project. The goal is to review the brief, engage the client and generate ideas to take forward in the design process. There are no time constraints therefore you can consensually terminate the phase of the design process at any time.

Requirements

Participants must write down all ideas on the post it provided

Client role

You are the client and have decision making authority over the project. The goal is to review the brief, engage the designer and generate ideas to take forward in the design process. There are no time constraints therefore you can terminate the ideation process consensually.

Requirements

Participants must write down all ideas on the post it provided

Design scenario 2

Company Profile

Ferrari S.p.A. is an Italian sports car manufacturer based in Maranello, Italy. Founded by Enzo Ferrari in 1928 as Scuderia Ferrari, the company sponsored drivers and manufactured race cars before moving into production of street-legal vehicles in 1947 as Ferrari S.p.A. Throughout its history, the company has been noted for its continued participation in racing, especially in Formula One, where it has enjoyed great success.

Competition Theme

"Design the most desirable car ever"

Among the mass production objects, cars are the most diffused, the most expensive, the most technologically advanced and above all still the most desired. What makes a car desirable? What makes a vehicle the actual platform of our dreams? What makes car design a promise for a forthcoming future? This is a competition to generate ideas for the most desirable car.

Guidelines

Participants are requested to submit design ideas of a car with a strong emotional impact. Any dimension or typology of cars are accepted as long as they represent a vehicle that people could dream about. The aim is to find out what makes a car a living object with a soul out of a mechanic components' assemblage.

The project should express a good balance of proportions, graphics, materials and technology, ideally creating an object that is able to move passions and desires.

Designer role

You are the designer and have decision-making authority in the project. You are tasked to guide the client

through this process. You have been hired by the client to review the brief, engage the client and generate ideas to take forward in the design process. There are no time constraints therefore you can terminate the ideation process consensually.

Requirements

You must write down all of your ideas on the coloured designated Post-its provided.

Client role

You are the client representing Ferrari who has hired the designer. You have decision-making authority over the project. This brief represents your request to the designer. The goal is to review the brief, engage the designer and generate ideas that will be taken forward at a later date. There are no time constraints therefore you can terminate the ideation process consensually.

Requirements

You must write down all of your ideas on the coloured designated Post-its provided.

Design scenario 3

Company Profile

NIKE, Inc. The company was founded on January 25, 1964 as Blue Ribbon Sports by Bill Bowerman and Philip Knight, and officially became Nike, Inc. in 1978. The company takes its name from Nike, the Greek goddess of victory; it is also based on Egyptian usage of "strength", "victory", nakht. Nike markets its products under its own brand as well as Nike Golf, Nike Pro, Nike+, Air Jordan, Nike Skateboarding and subsidiaries including Cole Haan, Hurley International, Umbro and Converse. Nike also owned Bauer Hockey (later renamed Nike Bauer) between 1995 and 2008. In addition to manufacturing sportswear and equipment, the company operates retail stores under the Niketown name. Nike sponsors many high profile athletes and sports teams around the world, with the highly recognized trademarks of "Just do it" and the Swoosh logo.

Competition Theme

"World AIDS Day - Victory through AIDS Awareness and Prevention"

Started on 1st December 1988, World AIDS Day is about raising money, increasing awareness, fighting prejudice and improving education. The World AIDS Day theme for 2009 is 'Universal Access and Human Rights'. World AIDS Day is important in reminding people that HIV has not gone away, and that there are many things still to be done.

According to UNAIDS estimates, there are now 33.4 million people living with HIV, including 2.1 million children. During 2008 some 2.7 million people became newly infected with the virus and an estimated 2

million people died from AIDS.1 Around half of all people who become infected with HIV do so before they are 25 and are killed by AIDS before they are 35.

Guidelines

Participants are requested to submit design ideas for a product campaign that balances both the NIKE brand and the message of World AIDS Day. The aim is to align as closely as possible through NIKE awareness, empowerment and prevention through any of the NIKE products. The project will be produced through an ad campaign (web, print and TV) therefore a theme is helpful to tie all the components together.

Designer role

You are the designer and have decision-making authority over the project. The goal is to review the brief, engage the client and generate ideas to take forward in the design process. There are no time constraints therefore you can terminate the ideation process consensually.

Requirements

Participants must write down all ideas on the post it provided

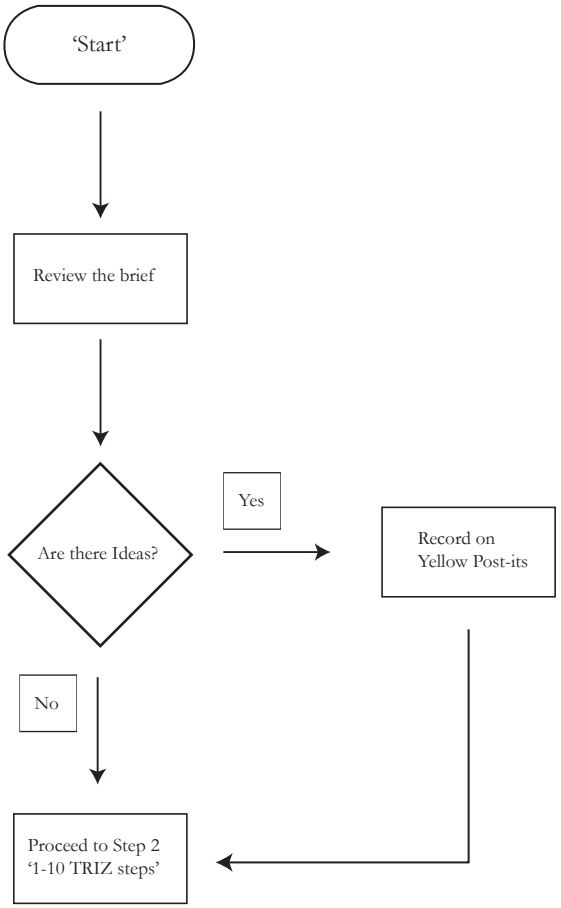
Client role

You are the client and have decision-making authority over the project. The goal is to review the brief, engage the designer and generate ideas to take forward in the design process. There are no time constraints therefore you can terminate the ideation process consensually.

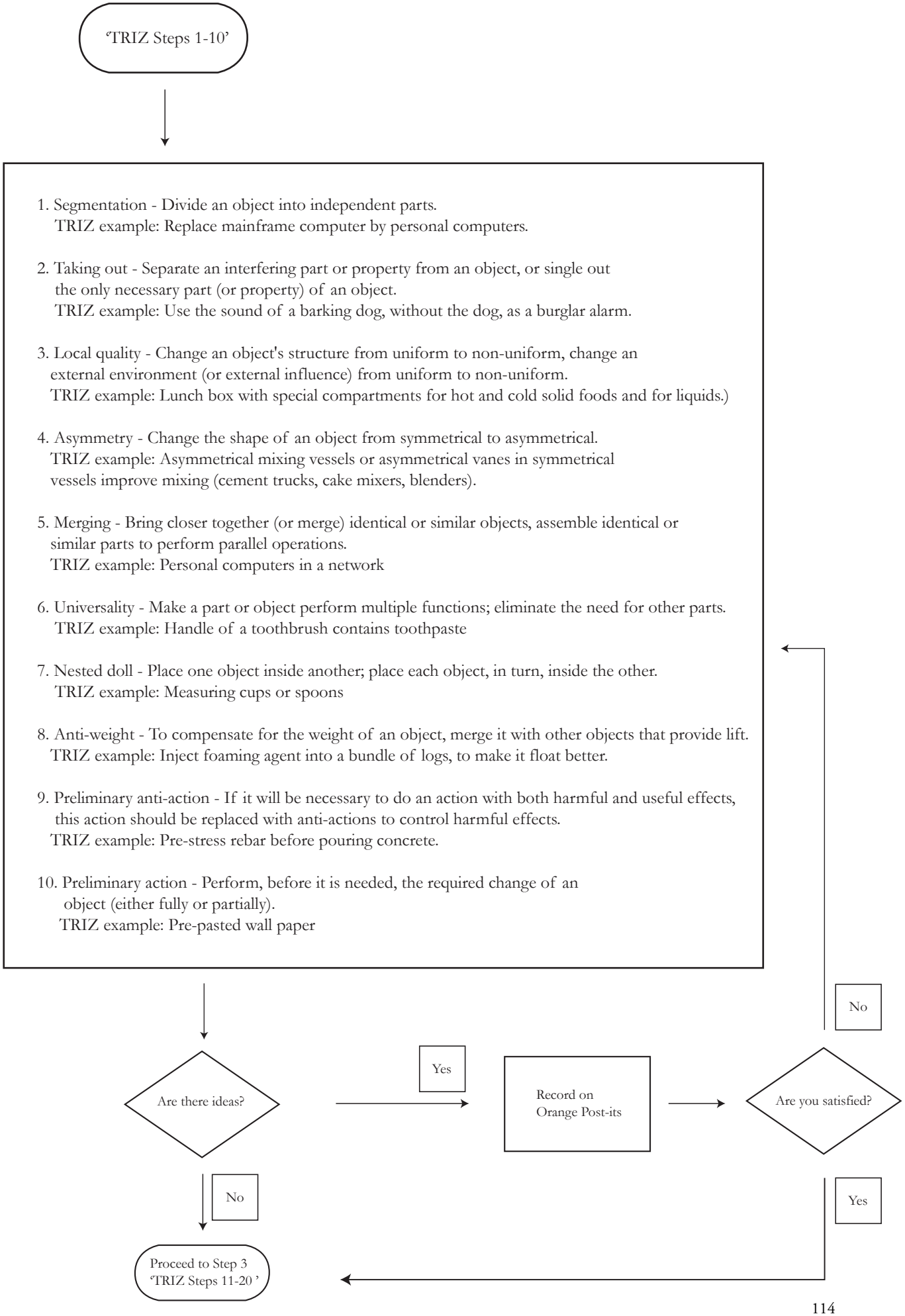
Requirements

Participants must write down all ideas on the post it provided

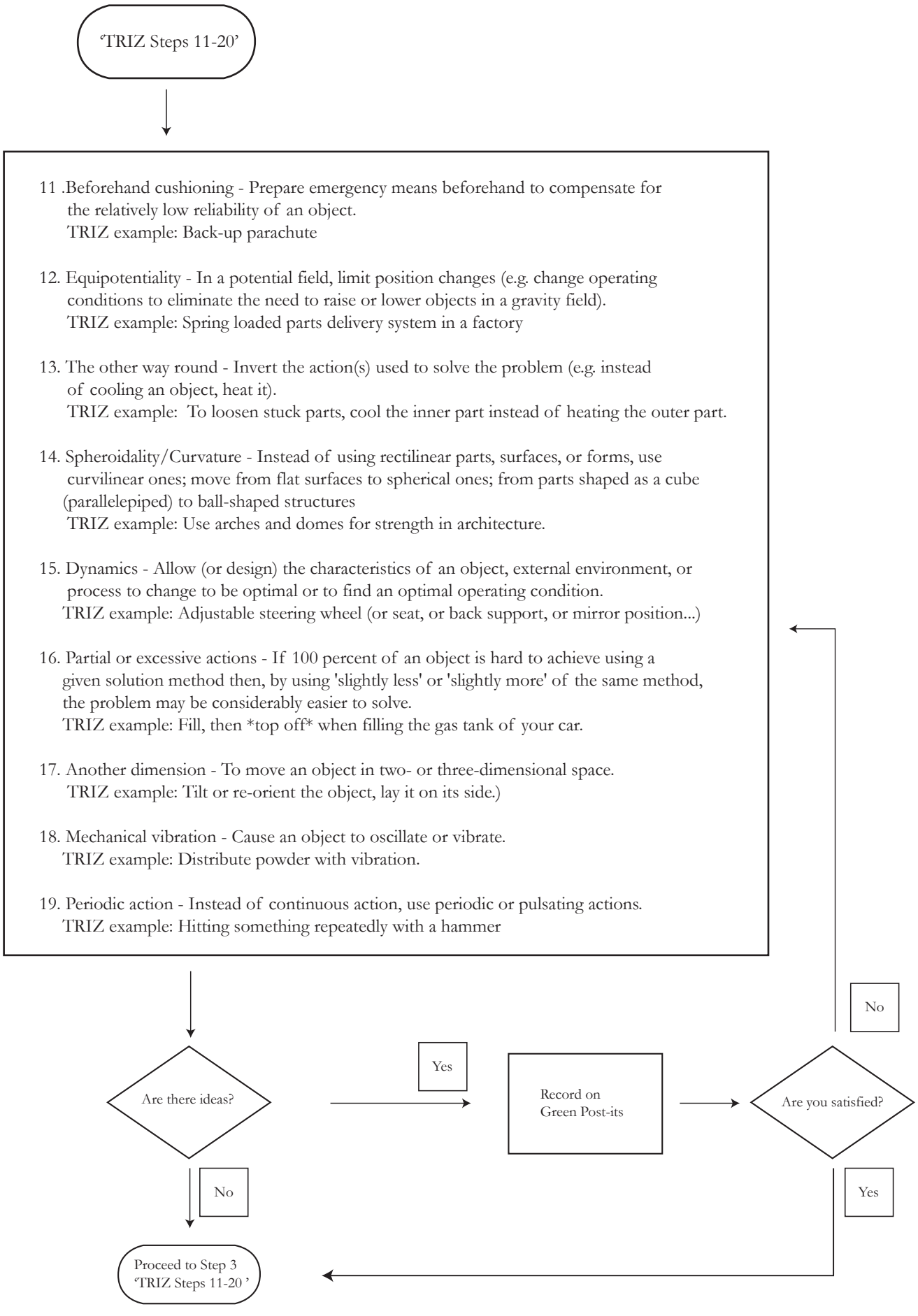
Step 1 of 6


'Start'
Review the brief
Are there Ideas?
Yes
Record on
Yellow Post-its
No
Proceed to Step 2
'1-10 TRIZ steps'

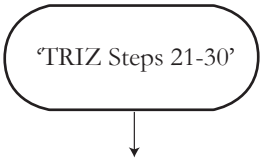
Step 2 of 6


'TRIZ Steps 1-10'
1. Segmentation - Divide an object into independent parts.
TRIZ example: Replace mainframe computer by personal computers.
2. Taking out - Separate an interfering part or property from an object, or single out the only necessary part (or property) of an object.
TRIZ example: Use the sound of a barking dog, without the dog, as a burglar alarm.
3. Local quality - Change an object's structure from uniform to non-uniform, change an external environment (or external influence) from uniform to non-uniform.
TRIZ example: Lunch box with special compartments for hot and cold solid foods and for liquids.)
4. Asymmetry - Change the shape of an object from symmetrical to asymmetrical.
TRIZ example: Asymmetrical mixing vessels or asymmetrical vanes in symmetrical vessels improve mixing (cement trucks, cake mixers, blenders).
5. Merging - Bring closer together (or merge) identical or similar objects, assemble identical or similar parts to perform parallel operations.
TRIZ example: Personal computers in a network
6. Universality - Make a part or object perform multiple functions; eliminate the need for other parts.
TRIZ example: Handle of a toothbrush contains toothpaste
7. Nested doll - Place one object inside another; place each object, in turn, inside the other.
TRIZ example: Measuring cups or spoons
8. Anti-weight - To compensate for the weight of an object, merge it with other objects that provide lift.
TRIZ example: Inject foaming agent into a bundle of logs, to make it float better.
9. Preliminary anti-action - If it will be necessary to do an action with both harmful and useful effects, this action should be replaced with anti-actions to control harmful effects.
TRIZ example: Pre-stress rebar before pouring concrete.
10. Preliminary action - Perform, before it is needed, the required change of an object (either fully or partially).
TRIZ example: Pre-pasted wall paper
Are there ideas?
Yes
Record on Orange Post-its
Are you satisfied?
No
Yes
No
Proceed to Step 3 'TRIZ Steps 11-20 '

Step 3 of 6


'TRIZ Steps 11-20'
11 .Beforehand cushioning - Prepare emergency means beforehand to compensate for the relatively low reliability of an object.
TRIZ example: Back-up parachute
12. Equipotentiality - In a potential field, limit position changes (e.g. change operating conditions to eliminate the need to raise or lower objects in a gravity field).
TRIZ example: Spring loaded parts delivery system in a factory
13. The other way round - Invert the action(s) used to solve the problem (e.g. instead of cooling an object, heat it).
TRIZ example: To loosen stuck parts, cool the inner part instead of heating the outer part.
14. Spheroidality/Curvature - Instead of using rectilinear parts, surfaces, or forms, use curvilinear ones; move from flat surfaces to spherical ones; from parts shaped as a cube (parallelepiped) to ball-shaped structures
TRIZ example: Use arches and domes for strength in architecture.
15. Dynamics - Allow (or design) the characteristics of an object, external environment, or process to change to be optimal or to find an optimal operating condition.
TRIZ example: Adjustable steering wheel (or seat, or back support, or mirror position...)
16. Partial or excessive actions - If 100 percent of an object is hard to achieve using a given solution method then, by using 'slightly less' or 'slightly more' of the same method, the problem may be considerably easier to solve.
TRIZ example: Fill, then *top off* when filling the gas tank of your car.
17. Another dimension - To move an object in two- or three-dimensional space.
TRIZ example: Tilt or re-orient the object, lay it on its side.)
18. Mechanical vibration - Cause an object to oscillate or vibrate.
TRIZ example: Distribute powder with vibration.
19. Periodic action - Instead of continuous action, use periodic or pulsating actions.
TRIZ example: Hitting something repeatedly with a hammer
Are there ideas?
Yes
Record on Green Post-its
Are you satisfied?
No
Yes
No
Proceed to Step 3 'TRIZ Steps 11-20 '

Step 4 of 6



21. Continuity of useful action - Carry on work continuously; make all parts of an object work at full load, all the time.
    TRIZ example: Flywheel (or hydraulic system) stores energy when a vehicle stops, so the motor can keep running at optimum power.

22. Skipping - Conduct a process, or certain stages (e.g. destructible, harmful or hazardous operations) at high speed.
    TRIZ example: Use a high speed dentist s drill to avoid heating tissue.

23. 'Blessing in disguise' or 'Turn Lemons into Lemonade' - Use harmful factors (particularly, harmful effects of the environment or surroundings) to achieve a positive effect.
    TRIZ example: Use waste heat to generate electric power.

24. Feedback - Introduce feedback (referring back, cross-checking) to improve a process or action.
    TRIZ example: Automatic volume control in audio circuits

25. Intermediary - Use an intermediary carrier article or intermediary process.
    TRIZ example: Carpenter's nail set, used between the hammer and the nail

26. Self-service - Make an object serve itself by performing auxiliary helpful functions.
    TRIZ example: A soda fountain pump that runs on the pressure of the carbon dioxide that is used to *fizz* the drinks. This assures that drinks will not be flat, and eliminates the need for sensors.

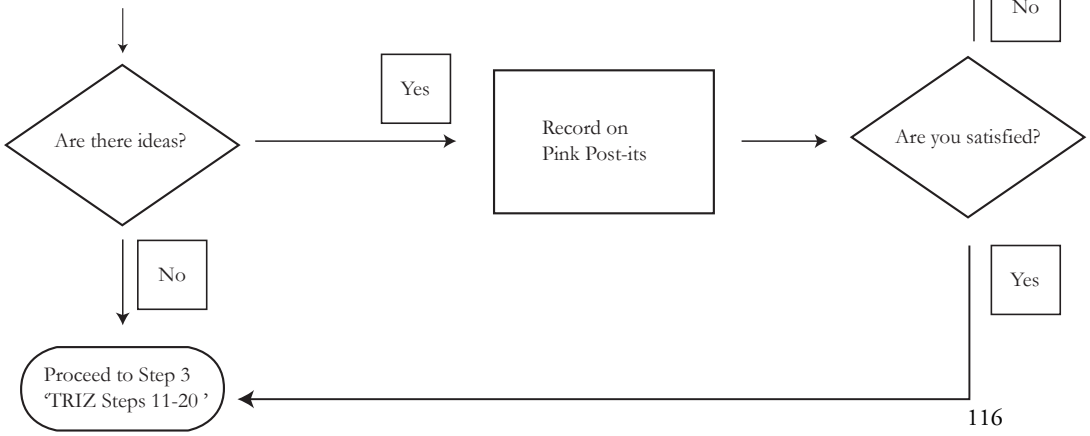
27. Copying - Instead of an unavailable, expensive, fragile object, use simpler and inexpensive copies.
    TRIZ example: Virtual reality via computer instead of an expensive vacation

28. Cheap short-living objects - Replace an inexpensive object with a multiple of inexpensive objects, comprising certain qualities (such as service life, for instance).
    TRIZ example: Use disposable paper objects to avoid the cost of cleaning and storing durable objects. Plastic cups in motels, disposable diapers, many kinds of medical supplies.

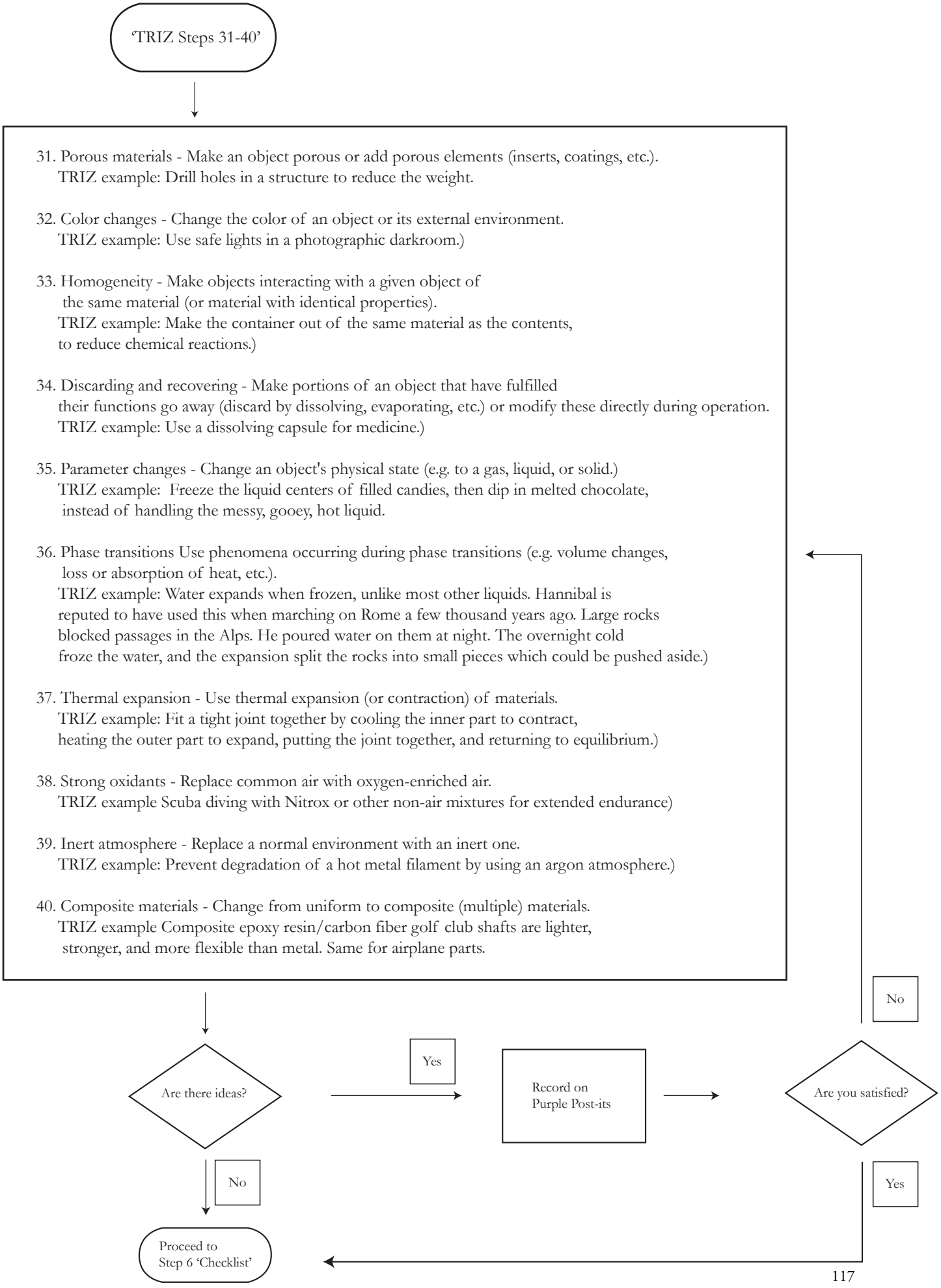
29. Mechanics substitution - Replace a mechanical means with a sensory (optical, acoustic, taste or smell) means.
    TRIZ example: Replace a physical fence to confine a dog or cat with an acoustic *fence* (signal audible to the animal).

30. Pneumatics and hydraulics - Use gas and liquid parts of an object instead of solid parts (e.g. inflatable, filled with liquids, air cushion, hydrostatic, hydro-reactive).
    TRIZ example: Comfortable shoe sole inserts filled with gel

31. Flexible shells and thin films - Use flexible shells and thin films instead of three dimensional structures
    TRIZ example: Use inflatable (thin film) structures as winter covers on tennis courts.



Step 5 of 6


'TRIZ Steps 31-40'
31. Porous materials - Make an object porous or add porous elements (inserts, coatings, etc.).
TRIZ example: Drill holes in a structure to reduce the weight.
32. Color changes - Change the color of an object or its external environment.
TRIZ example: Use safe lights in a photographic darkroom.)
33. Homogeneity - Make objects interacting with a given object of the same material (or material with identical properties).
TRIZ example: Make the container out of the same material as the contents, to reduce chemical reactions.)
34. Discarding and recovering - Make portions of an object that have fulfilled their functions go away (discard by dissolving, evaporating, etc.) or modify these directly during operation.
TRIZ example: Use a dissolving capsule for medicine.)
35. Parameter changes - Change an object's physical state (e.g. to a gas, liquid, or solid.)
TRIZ example: Freeze the liquid centers of filled candies, then dip in melted chocolate, instead of handling the messy, gooey, hot liquid.
36. Phase transitions Use phenomena occurring during phase transitions (e.g. volume changes, loss or absorption of heat, etc.).
TRIZ example: Water expands when frozen, unlike most other liquids. Hannibal is reputed to have used this when marching on Rome a few thousand years ago. Large rocks blocked passages in the Alps. He poured water on them at night. The overnight cold froze the water, and the expansion split the rocks into small pieces which could be pushed aside.)
37. Thermal expansion - Use thermal expansion (or contraction) of materials.
TRIZ example: Fit a tight joint together by cooling the inner part to contract, heating the outer part to expand, putting the joint together, and returning to equilibrium.)
38. Strong oxidants - Replace common air with oxygen-enriched air.
TRIZ example Scuba diving with Nitrox or other non-air mixtures for extended endurance)
39. Inert atmosphere - Replace a normal environment with an inert one.
TRIZ example: Prevent degradation of a hot metal filament by using an argon atmosphere.)
40. Composite materials - Change from uniform to composite (multiple) materials.
TRIZ example Composite epoxy resin/carbon fiber golf club shafts are lighter, stronger, and more flexible than metal. Same for airplane parts.
Are there ideas?
Yes
Record on Purple Post-its
Are you satisfied?
No
No
Yes
Proceed to Step 6 'Checklist'

Step 6 of 6

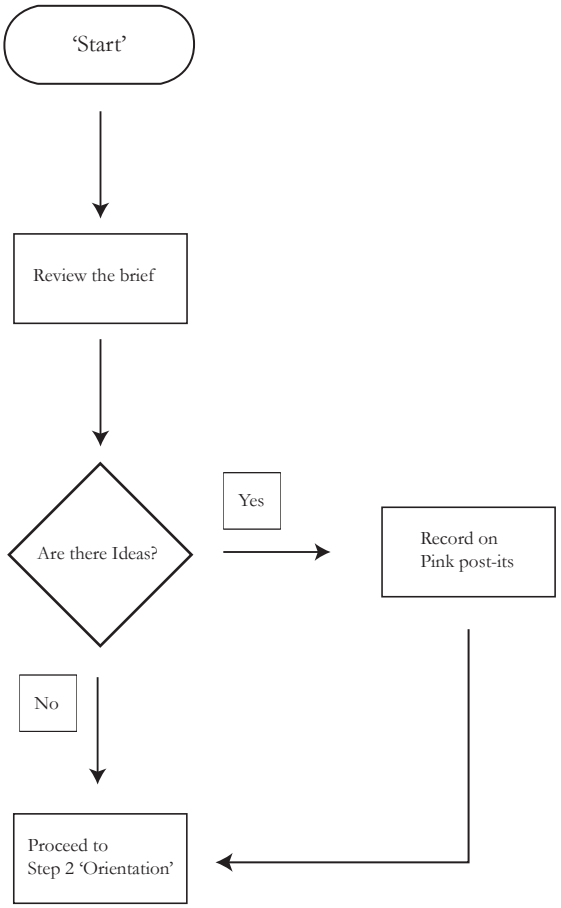
Checklist
Please ensure you have you included the following:

1. All the post-its
2. Completed evaluation
3. Contact details if you are interested in the results

Designer guidance for generating ideas
EiDOS

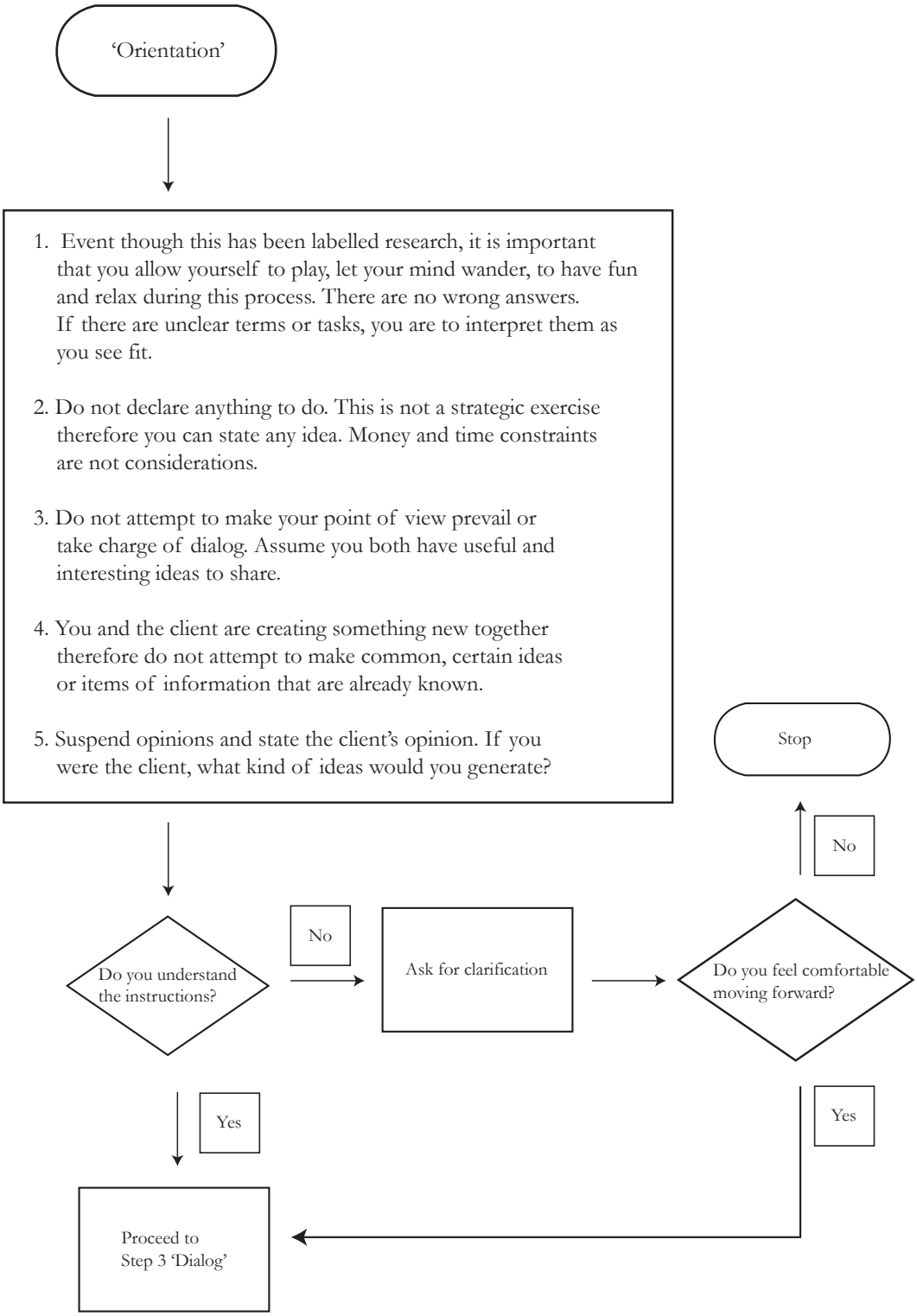
This is an exercise where both of you are encouraged to let go and design with no pressure or expectation.

Step 1 of 7

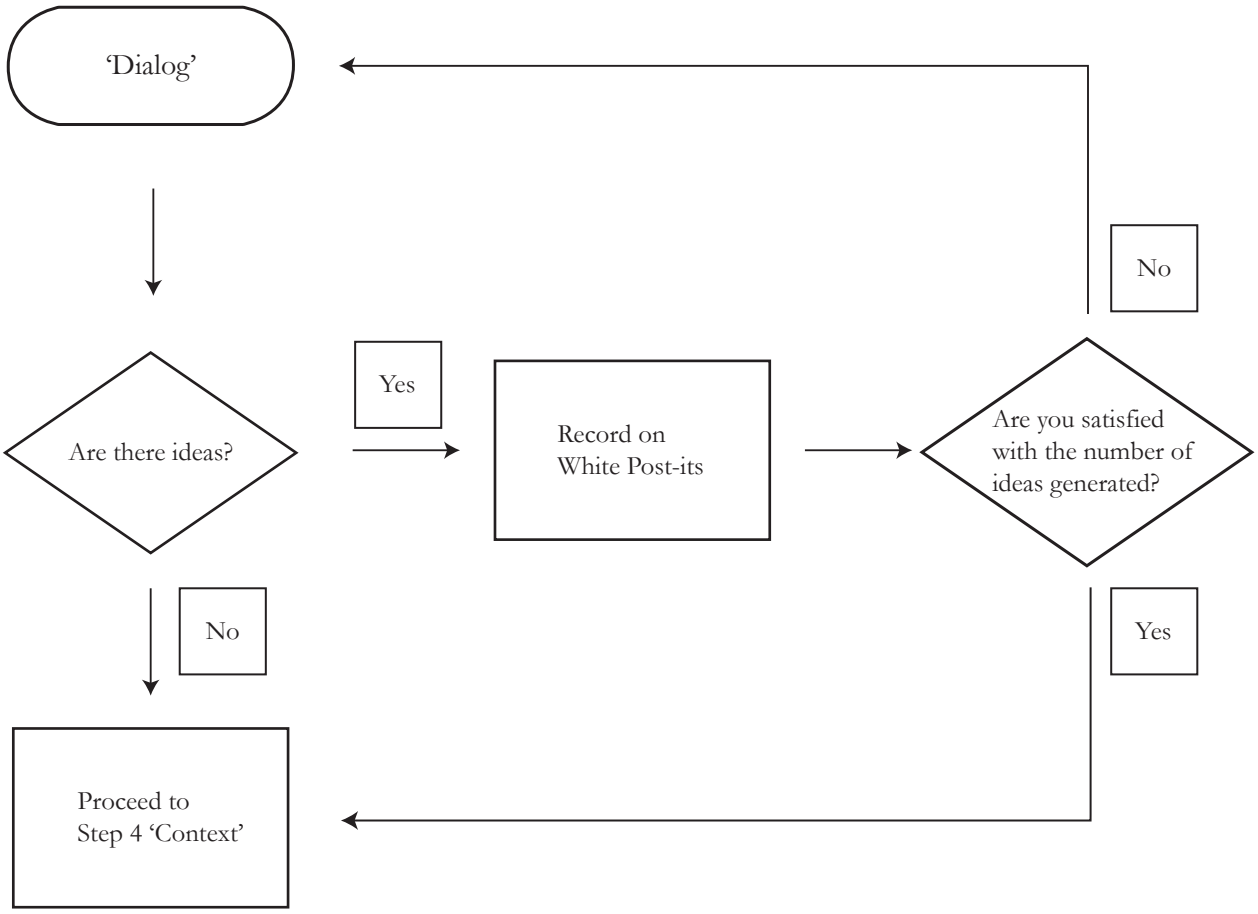


Note:
What kind of past design projects have you completed that resemble this project and what were your solutions?

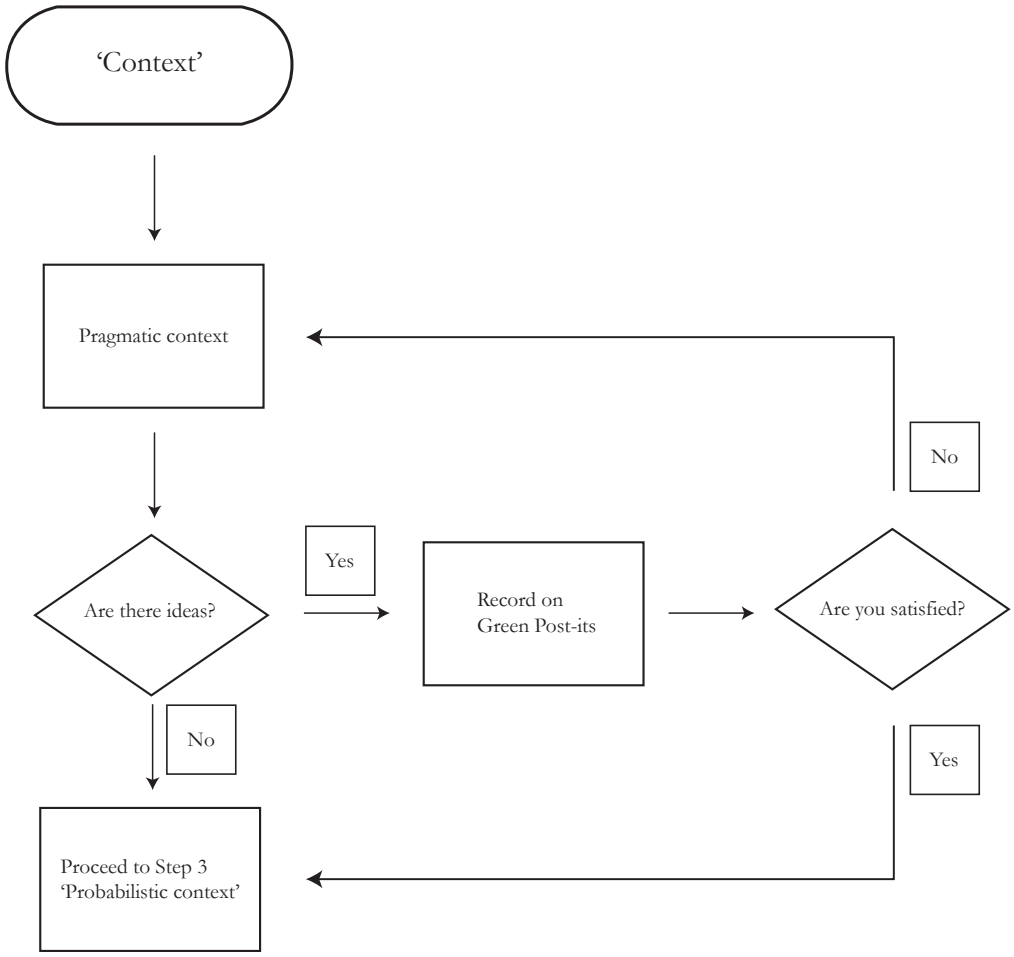
Step 2 of 7


'Orientation'
1. Event though this has been labelled research, it is important that you allow yourself to play, let your mind wander, to have fun and relax during this process. There are no wrong answers. If there are unclear terms or tasks, you are to interpret them as you see fit.
2. Do not declare anything to do. This is not a strategic exercise therefore you can state any idea. Money and time constraints are not considerations.
3. Do not attempt to make your point of view prevail or take charge of dialog. Assume you both have useful and interesting ideas to share.
4. You and the client are creating something new together therefore do not attempt to make common, certain ideas or items of information that are already known.
5. Suspend opinions and state the client's opinion. If you were the client, what kind of ideas would you generate?
Do you understand the instructions?
No
Ask for clarification
Do you feel comfortable moving forward?
No
Stop
Yes
Yes
Proceed to Step 3 'Dialog'

Step 3 of 7

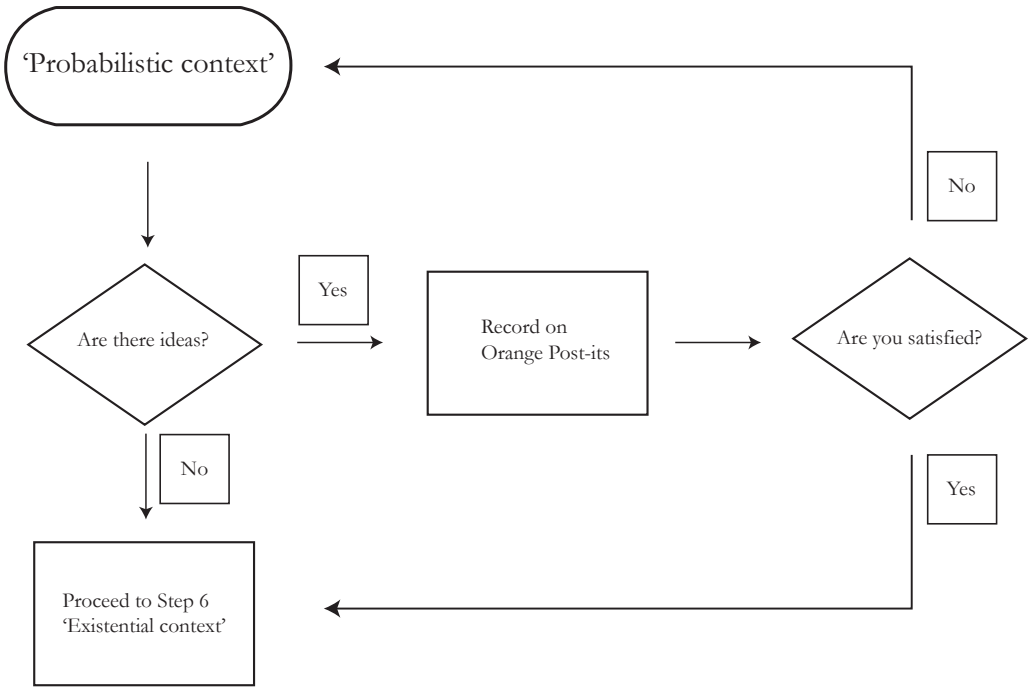

'Dialog'
Are there ideas?
Yes
Record on
White Post-its
Are you satisfied
with the number of
ideas generated?
No
No
Yes
Proceed to
Step 4 'Context'

Step 4 of 7



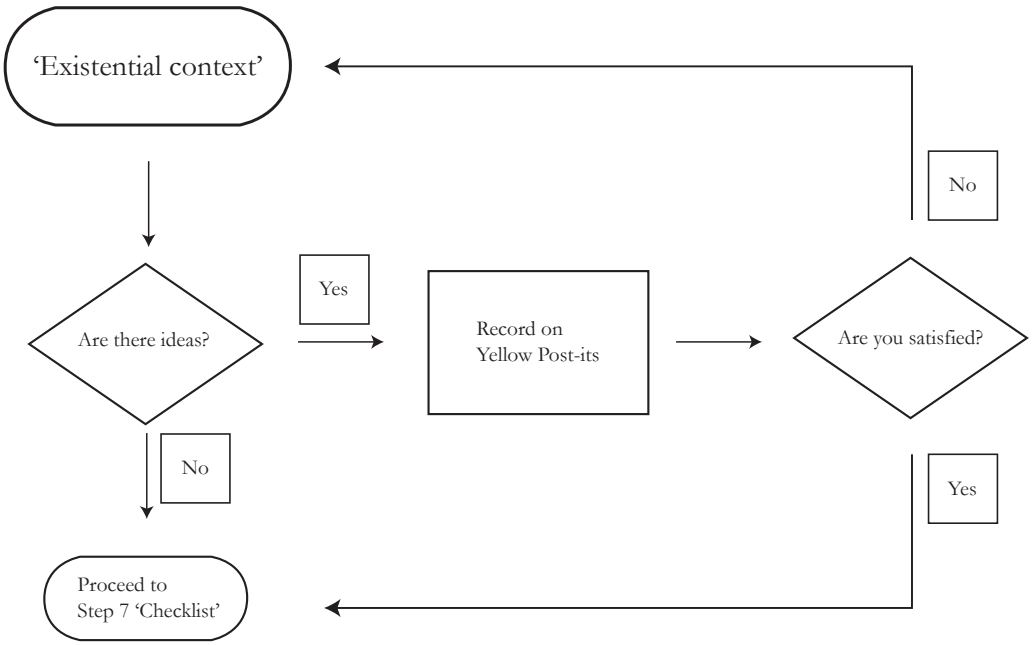
Note:
Pragmatic context can result in ideas relatesdto the best possible and most realistic design outcomes, given any existing constaints.

Step 5 of 7



Note:
Probabilistic context can relates to ideas associated to new and emerging trends.
What kind of ideas do you see coming out in the near future that could help?

Step 6 of 7



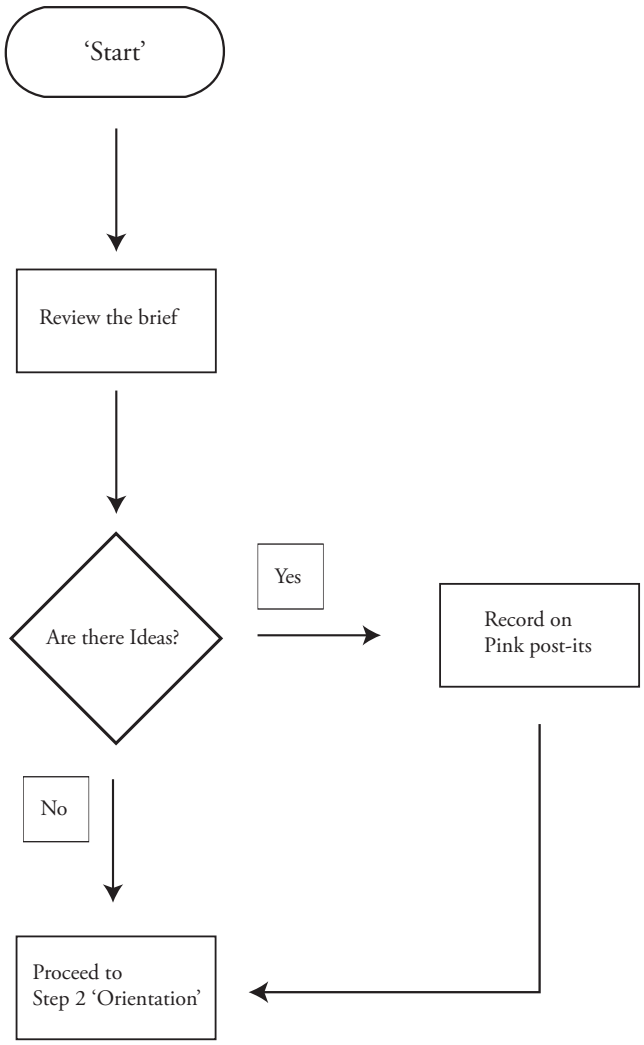
Note:
An existential context can result in ideas that reflect your personal and/or spiritual self.
What kind of ideas reflect your personal/spiritual meaning to the solution?

Step 7 of 7

Checklist
Please ensure you have you included the following:

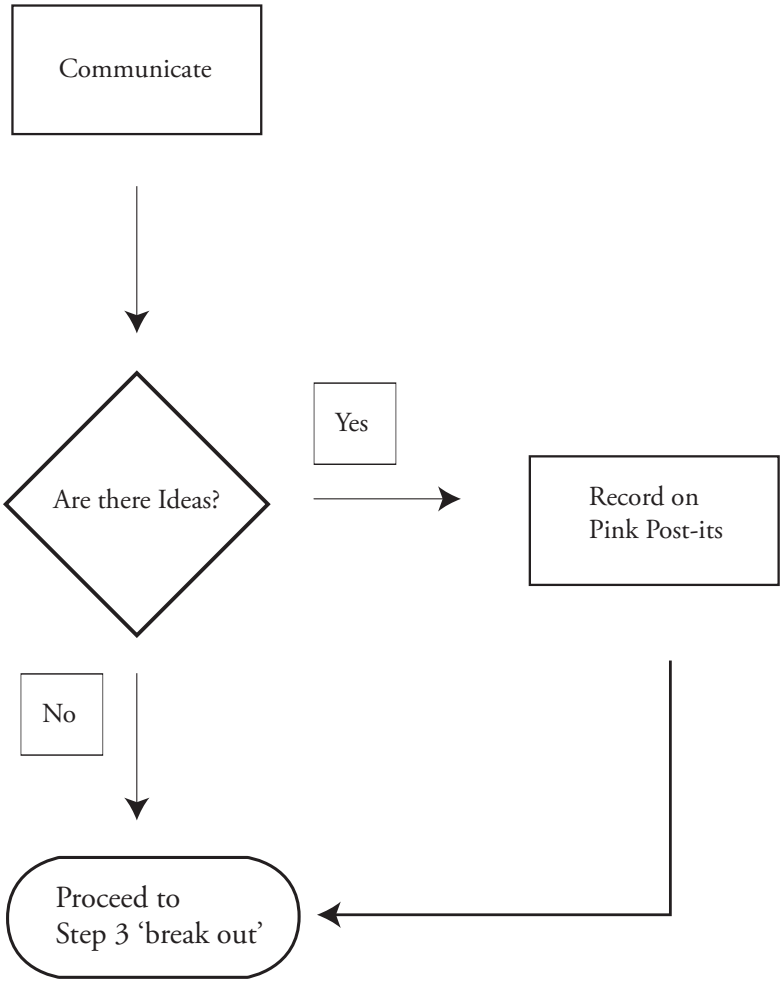
1. All the post-its
2. Completed evaluation
3. Contact details if you are interested in the results

Step 1 of 5

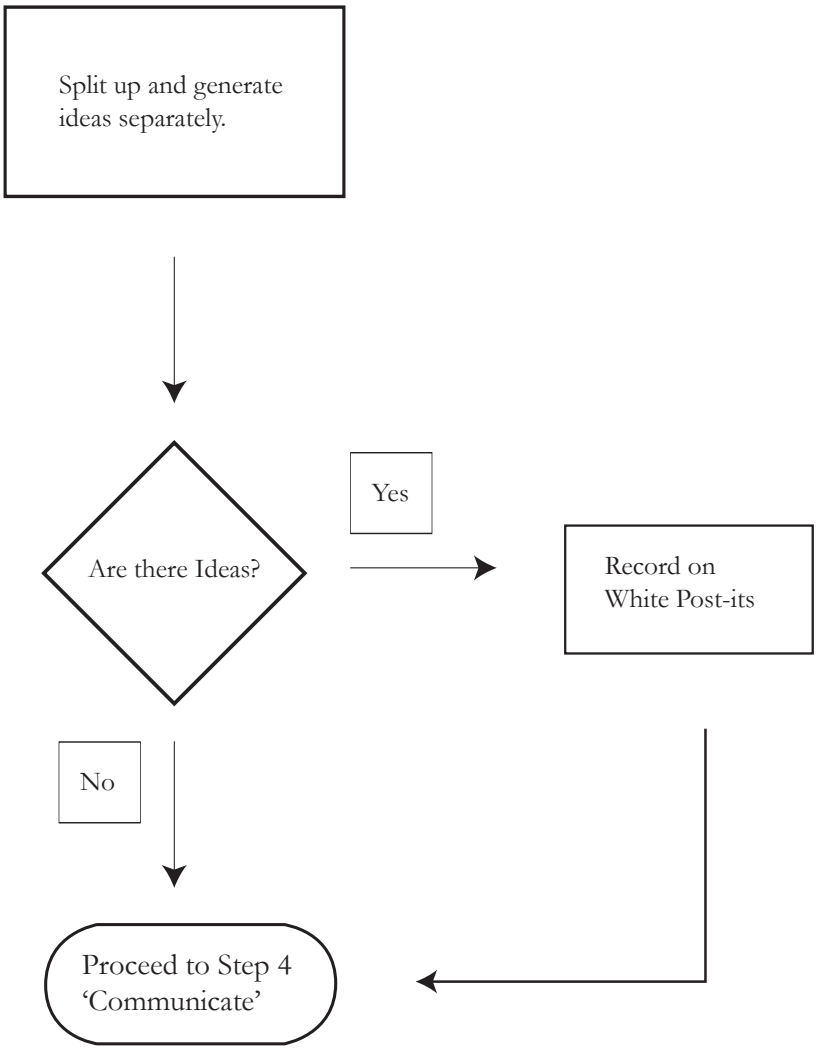


Note:
What kind of past design projects have you completed that resemble this project and what were your solutions?

Step 2 of 5

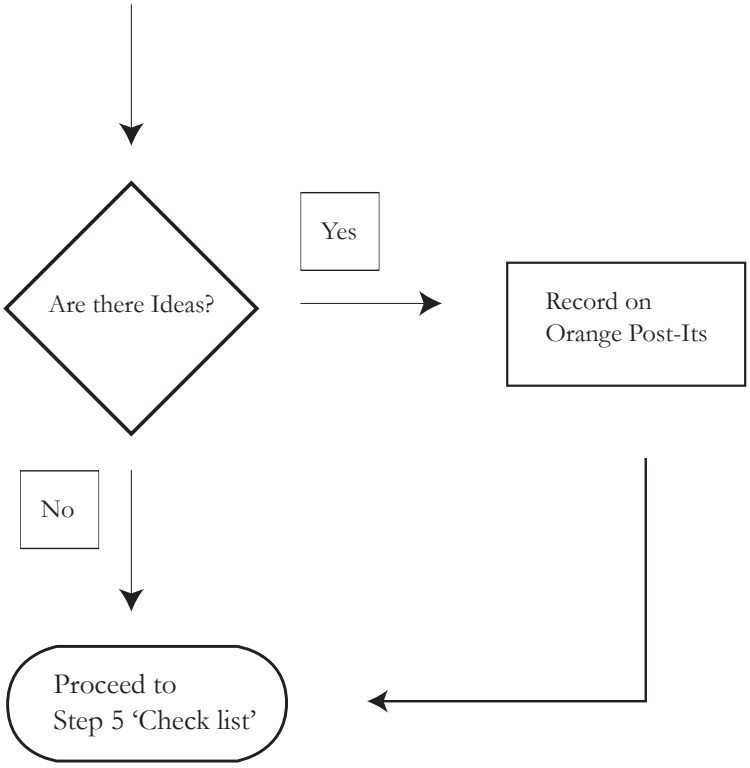

Communicate
Are there Ideas?
Yes
Record on
Pink Post-its
No
Proceed to
Step 3 'break out'

Step 3 of 5


Split up and generate ideas separately.
Are there Ideas?
Yes
Record on White Post-its
No
Proceed to Step 4 'Communicate'

Step 4 of 5

The client and designer will communicate their ideas and decide if the ideas are sufficent to stop the ideation, return to another step or to continue through the checklist.



Step 5 of 5

Checklist
Please ensure you have you included the following:

1. All the post-its
2. Completed evaluation
3. Contact details if you are interested in the results

PHASE I

The participants contacted me either through Professor Wood's MA – Design Futures class or in response to a flier distributed through the administration office in the design department as a design competition. Emails of the design activity were also sent to the Royal Society for the Advancement of the Arts. A request for participants was also made during a November '09 meeting at the Open University Design Research Society. Unfortunately, the design activity was drawn down from the anticipated 3 for each group to 2 in each of the 3 groups. During the testing one of the groups dropped out during the first design activity and were not available to be rescheduled. This activity was scaled down because of the lack of responses. This is the participant data of the paired participants summary of the of design activities using protocol analysis and a constrained model.

Group A	Occupation	Yrs. Experience	Sex	Familiar	Education level	Paid/Unpaid	Field	Role
Stephan Bischof	Freelance designer	1	Male	No	MA - Design	Paid	Design	Designer
Faith Denham	Technician and designer	14	Female	No	MA - Design	Paid	Interactive, imaging and 3d and object	Client

Group B	Occupation	Yrs. Experience	Sex	Familiar	Education level	Paid/Unpaid	Field	Role
Stephan Bischof	Unemployed (freelance designer	1	Male	No	Masters of Design	Paid	Branding, product and graphics	Client
Marian Nikman Freij	Student/graphic designer	2	Female	No	Master of Design	Paid	Web, print and branding	Designer

The following notes are made for Groups A and B from each of the design activities of each design tool.

Group A EiDOS Video notes

Faith and Stephan had a good rapport. They started out with the design of the activity going through the experience of a difficult design, but then went into the design brief. Faith stared the process of sharing an experience by talking about an unexpected innovative experience from what started out as an unexpected complication. They went on to the design task and wanted to share information from the packets. Faith tried to understand her role and the brief by writing down her ideas and interpretations. At the 25-minute mark they started going through the EiDOS steps after getting to a stopping point with their design process. They combined a process of checking of their ideas with the steps to see if they fit and they also extended their ideation with the steps as well. They generated many ideas but at the same time they developed two ideas for a formal design plan when on the contrary, the instructions specified that generating ideas were necessary. By this point they had experienced a shared eureka moment through their cyborg car and another car that absorbs and grows and has aspects of dimensionality. They referred from this point on back to the brief and the constraints and an iterative process of refining the ensued regarding the two ideas they wanted to pursue. The communication was consistent and laughter was present throughout. References to the design activity as being a test were made as well. The process of generating ideas or the ideation phase was treated as a mini design process including logo development. By 1:15:00 they were collaborating and both very engaged. They applied pragmatism as a method of describing their cyborg car, not generating more ideas. They had interpreted the Existential ideas as being only for the designer. The last part of the test, they were using each context to describe the ideas they had already written down. Stephan, the designer, followed Faith the client who provided more direction throughout with EiDOS.

Questionnaire

Faith

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions clear?	7	**How well did you know your partner?** Sort of, a bit, kinda to say hi have a beer talk crazy design ideas **How would you characterize the conversation?** Interesting and fun, playful, laughter = lots of vital **In your own words was there any point where you felt your ideas started to flow?** From the beginning
2. How well were your ideas explored?	10	
3. Howe well were the ideas explored with your partner?	10	
4. Did the instruction help?	8	

5. Were the ideas you generated creative?	10	**Was there anything standing out that inhibited or helped this process?** Fudge + H2O helped, laughter, better to hide the cameras where possible but understand not for here and didn't bother me **If there were 3 things you could change about this process of generating ideas for this competition what would they be?** To have earlier in the day i.e. not after work. Bigger paper better pencils – my designer kept breaking his. **How would you describe the term ideation?** Right now with difficulty – but generally speaking the creation/notation of ideas **Is this process different or similar to your own as a client or designer? If so how?** Do you mean was? If so in some ways – brainstorming, sharing, throwing of ideas, exchange more post-its than I am used to.

Stephan

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions clear?	8	**How well did you know your partner?** We are one – everything becomes and already is one
2. How well were your ideas explored?	8	**How would you characterize the conversation?** Ground breaking – rule breaking
3. Howe well were the ideas explored with your partner?	8	**In your own words was there any point where you felt your ideas started to flow?**
4. Did the instruction help?	8	At the beginning more fluently then slowed down

ON A SCALE OF 1-10		IN YOUR OWN WORDS
5. Were the ideas you generated creative?	10	**Was there anything standing out that inhibited or helped this process?** humour **If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Maybe in the morning (1) with coffee (2) ...and better pencils **How would you describe the term ideation?** Creation, evaluation and conclusion of ideas …a process of filtering... **Is this process different or similar to your own as a client or designer? If so how?** The use of a big piece of paper helps me most of the times and not writing opposite the client, but next to him/her "design with not design for"

Research notes

Stephan had a reluctance or inability to follow the activity instructions. Faith on the other hand referred to them and began to manage the activity through the instructions and this raises a key point during the activity regarding how to provide the participants a navigation of the overall the design process, each other (if they don't know each other), their role and what is supposed to happen within design activities. Another key point is how to balance the designer guidance for a design activity while allowing the designer and client autonomy. Group A did a brilliant job of communicating, but in light of their inability to use EiDOS or in effect to follow the design activity instructions, the outcome of two ideas is not totally unexpected. This could be attributed to the nature and scope of the design activity it had stated the goal was to generate ideas, but being given a design brief; they pursued a solution while referring or ignoring the design activity instructions. There also seems to be a lack of familiarity with role-playing as a client and designer and a preference for collaboration as you might find in a studio.

There was some concern from a research perspective about how the participants would adapt to their role. I was

also concerned with how well they might know each other and how that would play with their ability to generate ideas especially when my participants are mainly from Goldsmiths. This could also help ambiguities, as they would work through them together. This is complicated as it relates to communication. Did the tool help? Before going into and after coming out of the design activity, they both stated they would have preferred an earlier time of day. This unfortunately isn't possible since I needed to have access to the room and both participants had to be available. Both participants underlined words in the brief. They choose key words that they felt exemplified the brief.

Items changed for 2rd test

1. There were initially two video recording kits, one small at one end of the table and another smaller recorder on the other end. There was a comment by the participants that they felt distracted by it. The large recorder produced a file that had errors, could not be copied and therefore will not be used in future tests.
2. Typographic corrections were made to the text, although it did not hamper their ability to understand or comprehend the text.
3. Questionnaire question from
   were the instructions clear?
   To
   were the instructions for the design activity clear?

Summary

- The design activity of generating ideas became the design process.
- They collaborated very closely, calling into question the ability to carry out roles and their ability to envision the client's position as different from their own. Being that the tool is to help bridge communication and creative issues between the client and the designer, when designers are used to collaborating, how equipped are they to communicate with the client?

Group A TRIZ Video notes

They were more comfortable with the design activity. They were not that keen on doing another design activity related to a car. Stephan took less than 30 seconds to review the brief. They also referred to the instructions within 5 minutes of the activity. Faith ran the design activity even though Stephan had the instructions (TRIZ) often not aware or paying attention to the instructions. He was also much more vocal with ideas instead of writing them down. Faith was more focused and able to generate ideas and have an awareness of the activity. At one point at 17 minutes, Faith (client) instructed Stephan (designer) to read the instructions while she wrote ideas down and at 21 minutes he gave the instructions to the Faith (client). After step 1-10, Faith verbalized that she was not satisfied. They both seemed overwhelmed by the steps. At 24 minutes they were working more independently and less communication as they wrote often asking each other about what the other was drawing. At 28 minutes they are reading the instructions and providing solutions to each step. At 32 minutes they started drawing paying less attention to the steps. They seemed physically tired, often resting on their head on their hands at 57 minutes and frequently after.

Questionnaire

The participants collaborated on the questionnaires that could have inhibited honest responses or dissension. It can also highlight a possible lack of consensus between the participants and between the participants and the research context regarding the role or definition of ideation.

Faith

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear	4	**How well did you know your partner?** Better than last time
2. Were the instructions clear?	4	**How would you characterize the conversation?** Not as animated as b4 but none the less interesting and fun
3. How well were your ideas explored?	4	**In your own words was there any point where you felt your ideas started to flow?**
4. Howe well were the ideas explored with your partner?	6	Not really
5. Did the instruction help?	3	**Was there anything standing out that <u>inhibited</u> or helped this process?** Yes all the bloody TRIZ points too many to explore in 2
6. Were the ideas you generated creative?	4/5	hours

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		If there were 3 things you could change about this process of generating ideas for this competition what would they be? I'd like bigger paper **How would you describe the term ideation?** I wouldn't as I'm way too tired and can hear Kev yawn in **Is this process different or similar to your own as a client or designer? If so how?** Different – more post-its than I have

Stephan

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear	4 overkill	**How well did you know your partner?** Better than last time
2. Were the instructions clear?	4	**How would you characterize the conversation?** It is quiet late today
3. How well were your ideas explored?	4	**In your own words was there any point where you felt your ideas started to flow?**
4. Howe well were the ideas explored with your partner?	6	No, it was quite a blockage **Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	3	no
6. Were the ideas you generated creative?	4-5	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** More precise descriptions cars are too normal, a more creative subject would be suitable

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		How would you describe the term ideation? Controlled chaos **Is this process different or similar to your own as a client or designer? If so how?** Different = more people, up to date subject, morning, are more suitable for these kind of activities

Research notes

This process was iterative often going from conversations of past experiences, to how it might be applied and other ideas not necessarily related. Their process started out with conversation and where the design activity steps opened up other conversations it was useful for generating ideas but when there was less inspiration and synthesis with TRIZ. They reviewed the ideas they had generated through conversation and applied the TRIZ criteria to see if the idea fit. This process of fitting their ideas to TRIZ instead of TRIZ helping them generate ideas is important, but makes distinguishing which or how many steps generated ideas and which ideas were made and then fit into the TRIZ criteria difficult within a testing situation without a video to review.

Group A placebo Video notes

At 26 minutes they had gone through the whole process and began to second-guess the process by going back through them. There were two mobile phone interruptions from Stephan but they did not appear to affect Faith. This is the first and only session where they did not consensually stop.

Faith

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear	10	**How well did you know your partner?** Well I know he is Swiss + he likes football
2. Were the instructions clear?	10	**How would you characterize the conversation?** flowing
3. How well were your ideas explored?	10	**In your own words was there any point where you felt your ideas started to flow?**
4. Howe well were the ideas explored with your partner?	10	From the beginning
5. Did the instruction help?	10	**Was there anything standing out that inhibited or helped this process?** Not really – I suppose that it was good to have worked w/my
6. Were the ideas you generated creative?	7	partner before
		If there were 3 things you could change about this process of generating ideas for this competition what would they be? Different times would be good although I realize that my prove difficult
		How would you describe the term ideation? All the things we have done over the past weeks! Talking and expressing
		Is this process different or similar to your own as a client or designer? If so how? We have operated more as a team in all the exercises rather

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		having delineated roles.

Stephan

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions clear?	10	**How well did you know your partner?** Irish and she likes Whiskey
2. How well were your ideas explored?	9	**How would you characterize the conversation?** Quick and efficient
3. Howe well were the ideas explored with your partner?	9	**In your own words was there any point where you felt your ideas started to flow?**
4. Did the instruction help?	8	Straight off
5. Were the ideas you generated creative?	10	**Was there anything standing out that inhibited or helped this process?** The creative mood
		If there were 3 things you could change about this process of generating ideas for this competition what would they be? Nothing, this was very effective
		How would you describe the term ideation? Kick starting creativity
		Is this process different or similar to your own as a client or designer? If so how? More time consuming

Exit interview

Which session did you find the communication flowed better?

- Faith – this one or the first one
- Stephan – the first one

Which session do you believe yielded the most ideas?

- Faith – the first one, the most creative
- Stephan - yeah

Did you switch roles? If so why?

- Faith - We tended not to operate as client and designer, we operated as a team
- Stephan – yeah collaboration was more of a creative flow

Which session do you believe was most creative?

- Faith - the first one, this one felt more corporate
- Stephan - agreed

Which session hindered your communication most?

- Faith – I found the steps too many, too much to heavy at the end of the day. If it were a different product.
- Stephan – 2nd, variety encourages creative motivation

Which session was the least creative?

- Faith - 2nd session
- Stephan - yeah

What do you see as the purpose of the session?

- Faith - Coming up with ideas is fun
- Stephan - fudge is good for ideation

What will you take from this design activity?

- Faith - Coming up with ideas is fun
- Stephan – fudge is really important for the ideation process

Were there any significant changes to your approach between each session?

- Stephan – the third one, the first one we went nuts, the second one was mundane and the third felt much more efficient
- Faith – invigorate at the first one and the second one more drained

Have you used ideation tools before?

- Faith – mind mapping seeing what relates to what
- Stephan – yes, ideational drawing, tracing paper, forming ideas by putting them to paper, ideation based on research by getting more material in storytelling, ideas to paper then manipulating the ideas from that

Do you think they are useful and why?

- Faith – small pieces of paper were limiting
- Stephan – the project is not big enough, because it's solely based on ideation, but in my own projects you can see the outcome and at the outcome you can see how useful the ideation process was. The main ideas were developed through conversation.

PHASE I

Group B (Stephan and Marian) Video notes

The participants had never met and their lack of rapport was obvious. Ironically, Stephan made a comment the sharing exercise could be incorporated into the exercise but this step did not occur. It is difficult to hypothesise whether this step would have helped, but considering the moments of silence, sharing experiences may have helped. Stephan had gone through the same brief and stated once going into the session, 'What does he have for us today' and later stated that he has seen this brief before. They skipped the first two pages of the instructions at the start, which was confirmed by Stephan as unimportant. There was confusion regarding who had what information and what was duplicated. There also was little understanding regarding the process although Stephan had stated it was an ideation tool to help them through the process. This was at the same time and admission but also a negation of the process by disregarding the protocol and test. Marian did a much more thorough job of reviewing the steps before starting. They had some ideas, but they were also less inclined to write them down. They started with very narrow ideas of the design activity and did not derivate to solutions other than cars. At 36:34:00 Stephan stated that this was a session to generate ideas. There seemed to be some push and pull from Stephan to be more open and by Marian to be more pragmatic. They discussed aspects of the car colour, materials, buyer and functionality. The whole of the video was spent examining possibilities within the car that was known to both of them. There were little or no new understandings achieved.

Questionnaire

Marian

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	5	**How well did you know your partner?** Not at all
2. Were the instructions from the designer clear?	8	**How would you characterize the conversation?** Open, relaxed
3. How well were your ideas explored?	6	**In your own words was there any point where you felt your ideas started to flow?** Step 4
4. Howe well were the ideas explored with your partner?	10	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	5	Maybe the instructions where a little bit inhibitious because I didn't really understand them all

ON A SCALE OF 1-10		IN YOUR OWN WORDS
6. Were the ideas you generated creative?	10	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** A short introduction to what was expected of this. Also, the client/user aspect could maybe have been clarified. Who was this car for? **How would you describe the term ideation?** The development of ideas **Is this process different or similar to your own as a client or designer? If so how?** Different usually the client knows more clearly what s/he wants and for whom

Stephan

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	5	**How well did you know your partner?** Not at first
2. Were the instructions from the designer clear?	8	**How would you characterize the conversation?** Balanced, friendly
3. How well were your ideas explored?	6	**In your own words was there any point where you felt your ideas started to flow?** Step 4
4. Howe well were the ideas explored with your partner?	10	**Was there anything standing out that inhibited or helped this process?** Slightly confused with the strictness of the ideation guide
5. Did the instruction help?	5	
6. Were the ideas you generated creative?	10	**If there were 3 things you could change about this process of generating ideas for this competition what would they**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		be? Larger piece of paper with colourful pens more people music **How would you describe the term ideation?** The generating of concepts (concept development) **Is this process different or similar to your own as a client or designer? If so how?** I don't follow a guide when I am ideating

Research notes

The key events were that the video equipment died an hour into the design activity therefore an hour was lost. This design activity like the first went for two hours. Like in the first design activity both participants underlined what they thought were key words paying special attention to how the design brief should be interpreted, but this did not extend to the next page when the actual activity started. It's because of this I have modified the instructions to begin with a sharing dialogue but further explain to continue with Step 1 on the sheet which instructs the participants to review the brief. There appeared to be some collaboration between Marian and Stephan in that, Stephan produced no post-its during this process and their evaluations were the same. Stephan had mentioned in this session that he wanted bigger paper, but this could make discriminating separate ideas more difficult.

There are questions arising whether it's possible for the designer to mediate the design process, their process and the client. Experience in the field of design seems critical in this area since they have more to juggle. Within the context of the design activity, there is an element of the activity, but in this case there is also an element of designing that includes explorations, doing and reflection that were absent. There is also a difference between Stephan who has participated in both Group A and B and his female counterparts. The females thus far are significantly more aware of instructions of the activity.

The scheduled participants where Susanna and Marian but Susanna cancelled and I scheduled Stephan. Reusing Stephan for two EiDOS tests is risky since it can develop into anticipation and preconception, but at no point was there a debriefing to confirm the research goals or intentions for the testing. Upon filling out the participant information form along with Marian, Stephan asked while going into the testing room what this activity was about. While there are still concerns regarding his adaptation to the design activity and more so, his

effect on Marian in her first experience, it also highlights a realistic challenge for any designer to use a tool an ideation tool in order to develop new possibilities. This is an evolving subtext which in this light is a legitimate query to the effectiveness of an ideation tool not just in comparison to other tools, but as it affects the life of a tool within similar or very different design scenarios. With this said, I will be changing the scenarios for the third test, not to focus on design complexity. In speaking with a colleague, his design firm has been tasked with developing a campaign for Nike for worldwide AIDS awareness; this could be an interesting topic for the design activity.

Items changed after 2nd test

1. The initial instructions were put into a document instead of a video recording.

Items changed for 3rd test

There were two changes in the instructions because the participants were not using them as they went through the design process. This could say more about how designers use ideation tools, but a slight change in the directions that is more explicit may alleviate this or it may highlight a more significant issue regarding designers and their awareness of ideation tools or other algorithms during ideation.

1. Scenario instructions from:

   Designer role

   You are the designer and have decision-making authority in the project. The goal is to review the brief, engage the client and generate ideas to take forward in the design process. There are no time constraints therefore you can terminate the ideation process consensually.

   Requirements

   Participants must write down all of your ideas on the post it provided.

   To:

   Designer role

   You are the designer and have decision-making authority in the project. You are tasked to guide the client through this process. You have been hired by the client to review the brief, engage the client and generate ideas to take forward in the design process. There are no time constraints therefore you can terminate the ideation process consensually.

   Requirements

   You must write down all of your ideas on the post it provided. Participants after the design activity are asked not to discuss which tests they have completed in light of the fact that their partner may or may not have completed it.

2. The client designer and client instructions were changed from

   4. At this point we will start the test.

   5. Please share with the other participant a moment where you had a design or work situation dealing with a client that was difficult, how you handled it and what the outcome was. The order of who goes first is up to you.

   To:

   4. At this point we will start the design activity by sharing with the other participant a moment where you had a design or work situation dealing with a client that was difficult, how you handled it and what the outcome was. The order of who goes first is up to you.

   5. After you are finished sharing go to step one of the design activity.

Group B (Stephan and Marian)TRIZ Video notes

Marian struggled with the instructions and their meanings, while Stephan described past design activity experiences and how the steps were either relevant or how to interpret them. Stephan made a comment at the beginning of the activity regarding that the roles and how they were not important. He also encouraged within the first 5 minutes to skip steps. During the process, Stephan stated that 'TRIZ is hell" and that he had gone through it with his other partner. Stephan's comments highlighted some reservations I had about having a participant who has gone through at least one of the design activity with a participant who hadn't. They used the internet at 00:37:40 on one of the computers that were in the room to reference cars. At 00:58:00 Stephan was visibly irritated with the process and both participants frequently looked at their watches.

Questionnaire

Stephan

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions provided to you in the packet clear?	7	**How well did you know your partner?** better
2. How well were your ideas explored?	4	**How would you characterize the conversation?** even
3. Howe well were the ideas explored with your partner?	5	**In your own words was there any point where you felt your ideas started to flow?** First 2 stages
4. Did the instruction help?	1	**Was there anything standing out that inhibited or helped this process?** humour
5. Were the ideas you generated creative?	4	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Not so many instructions **How would you describe the term ideation?** brainstorming

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		Is this process different or similar to your own as a client or designer? If so how? Different – I like drawing on a large scale

Marian

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	1	**How well did you know your partner?** Met him once before
2. How well were your ideas explored?	4/5	**How would you characterize the conversation?** informal
3. Howe well were the ideas explored with your partner?	6	**In your own words was there any point where you felt your ideas started to flow?** no
4. Did the instruction provided for you help?	1	**Was there anything standing out that inhibited or helped this process?**
5. Were the ideas you generated creative?	2	Weird tasks inhibited **If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Clear and meaningful instructions **How would you describe the term ideation?** ok **Is this process different or similar to your own as a client or designer? If so how?** It seems meaningless (the tasks)

Group B (Stephan and Marian) Placebo Video notes

They both started the design activity by writing on the brief and made notes. They don't seem to be working together. Stephan starts by writing down his ideas even though Marian had gone back to re-read the brief. They also differ on their personal views of AIDS. He seems to try and move the process forward, but Marian is apprehensive on what and who it is for and Stephan just jumps in. My observation is that they were problem solving and not generating ideas. There is scrutiny about what might work and why something might not. Without more information about the audience and for what, Marian stated that she was not comfortable being able to continue. She is not dealing with ambiguity dealing with which culture (western or eastern culture). Stephan helped in providing some guidance in the role of the designer, but Marian was looking to him to provide more information about all aspects of the brief (media delivery, product, audience) at 29 minutes they were still working on the audience and not generating ideas.

Marian

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions provided to you in the packet clear?	10	**How well did you know your partner?** 3rd meeting
2. How well were your ideas explored?	7	**How would you characterize the conversation?** Informal quite constructive
3. Howe well were the ideas explored with your partner?	7	**In your own words was there any point where you felt your ideas started to flow?**
4. Did the instruction help?	1	More or less, yes
5. Were the ideas you generated creative?	7	**Was there anything standing out that inhibited or helped this process?** It was somewhat unclear who this campaign was for **If there were 3 things you could change about this process of generating ideas for this competition what would they be?** A should always be who a design/campaign etc. is for **How would you describe the term ideation?**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		creating/developing ideas **Is this process different or similar to your own as a client or designer? If so how?** The client usually knows more precisely what s/he wants but there is usually a process of conversation (like here)

Stephan

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions clear?	7	**How well did you know your partner?** Better
2. How well were your ideas explored?	4	**How would you characterize the conversation?** Realistic and constrictive
3. Howe well were the ideas explored with your partner?	5	**In your own words was there any point where you felt your ideas started to flow?**
4. Did the instruction help?	1	At stage 3
5. Were the ideas you generated creative?	4	**Was there anything standing out that inhibited or helped this process?** Maynards (2 pm appointment) **If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Drawing web group **How would you describe the term ideation?** Understanding the context and create ideas in respect to it **Is this process different or similar to your own as a client or**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		designer? If so how? Different; all different tools but I like the undirectiveness of the instructions

Research notes

Reflecting on the design activity Marian was focused much more on figuring out the design brief and then critiquing ever single idea that they were quite ineffective for generating ideas. It may be there was much more of a contrast to Stephan's approach but in their roles, Stephan was ineffective at guiding Marian through.

Exit interview

Which session did you find the communication flowed better?

- Marian – the first one (they were all similar... I don't know)
- Stephan – the first one

Which session do you believe yielded the most ideas?

- Marian – maybe the third one
- Stephan – yeah, the third went straight to the point

Did you switch roles? If so why?

- Marian – yes, because of stephan's experience and just to switch (the roles were not clear); I have never been a client
- Stephan – did not respond

Which session do you believe was most creative?

- Marian – the first and third session (lots of test)
- Stephan – the first and third session these were self directed (we didn't follow the instructions at all)

Which session hindered your communication most?

- Marian – during each of the sessions there were times when we didn't understand each other. The 2nd was the most difficult.
- Stephan – two because of the text

Which session was the least creative?

- Marian – this one (third) and also the first one; less information to read
- Stephan – self directed

What will you take from this design activity?

- Marian - no answer
- Stephan – the ideation process is solely based on communication and post-its. Ideation can involve more than one set of tools. It has to do with getting to know the person so that you start thinking similar.

Were there any significant changes to your approach between each session?

- Marian - no
- Stephan – no

Have you used ideation tools before?

- Marian – yes in school; usually more of a brainstorming and mind mapping; using images to explain ideas
- Stephan – ideational drawings, contextualizing drawings and drawing directions and taking paths, research based on books. Collages to randomize

Do you think they are useful and why?

- Marian – because otherwise I can't get anything done. It kicks things off.
- Stephan – to explore the full potential.

Researcher notes during exit interview

After asking which activity was most creative which was the first question, they had a hard time recalling the prior activities and which activity they had the best communication. Neither of them used the ideation tools during the design process, per the interview although they stated that the second design activity was the most difficult because there was so much instruction. Mariann in particular would have preferred to have a more detailed design brief especially regarding the client and especially who the target audience is. Marian also stated that she knew nothing about the subject matter and therefore felt unable to effective design in those situations referring to the car design activities. They both learned ideation in school as a method of brainstorming, mind mapping, pictures and drawing but they did not do these activities when they were not able to generate ideas, they conducted them during the initial stage of the design process, with the design brief in mind.

Group A+B summary

The research activities showed a couple of things. One was that both teams worked collaboratively instead of keeping with the roles. They also were not adept at following the instructions until they got to a stopping point which more than adequately raises significant questions when it comes to role play for designers and also if they are not formally aware of when or how to use ideation tools, then when do they use them and for what reason(s) do they use them. In this case, both groups were less focuses on the design activity steps or ideation tools and were more concerned with developing a design outcome which is indicative of the profession.

Schön described a talk-back where the complexity of the process may produce intended or unintended results, such that they could form a new appreciations and understandings and by making new moves, but this did not occur as much as the iterative process of generating a few ideas, iterating and applying them to the ideation tool steps (Schön 1991). The process as a design session was done with little reflection of the process or the difference between the intended outcomes and the real outcomes. The activity did not require them to provide reflection and given the lack of familiarity with the brief they may not have formulated a conception of how to solve the problem but their approach to the design activity changed. Specifically as it relates to Stephan, once he had gone through the process once he instructed Marian on which parts were not important. There are questions regarding what designers do during the ideation phase process. There was so much attention paid to the design brief, but not the actual design steps of ideation. The conversations, when they occurred and when they were random, there was a higher probability that they could have a shared ah-ha moment. When they focused on the details of the design brief, they could only clarify what each are doing and if it was right. Perkins (1997) made comments in Moreau and Dahl's paper (2002, pp. 50) about the arduous nature of revealing genuine novelty, but in both groups ideas flowed with the conversation. The conversations affirm the stance that 'that creativity consists of reassembling elements from existing knowledge bases in a novel fashion to produce a new idea (Gagne and Shoben 1997; Hampton 1997; Ward 1994). The participants could not break from their experience or knowledge to develop 'new ideas' because the ideation tools played a role in catalysing either a stepping stone to another idea or inhibited them to trying to figure out the step and how the ideas they had already generated applied or how the idea applied to the brief.

Group A's sessions showed consistency where the most experienced designer took control in spite of the roles. In all of the Group A tests, Faith took a leadership role, but not necessarily a guiding role. When the conversation went flat she referred to the instructions during the first session and thereafter she was much quicker to refer to them but allowed the conversation to develop around and beyond it. In Group B Stephan managed his sessions with Marian in that he excluded and included information as he saw fit and unfortunately information that had been prohibited along with many judgements regarding which ideas were relevant (TRIZ). This supports mental habits even in novice designers using unknown tools but more so, the prior knowledge regarding the need and function of the tool also influenced their outcomes as products instead of ideas.

Neither group had an element of the client and designer roles. None of the participants in their groups knew each other well, but they all collaborated as opposed to keeping with roles. A benefit of having Stephan in both tests is that he chose a designer role in Group A and chose a client role in Group B. This allowed his approach and behaviour to be observed in a different context to the other participants. Based on the interviews Stephan and Faith stated that they felt collaboration was more creative, but the question regarding how this occurs with the client is still unknown. This does however elude to the limitations of using designers within this context. There seemed to be, at least with TRIZ, a loss of focus with the problem or any other problems and they tried to solve TRIZ as another problem entirely. They took each step as a solution instead of understanding how each solution affected the whole situation.

There were a couple of issues that the ideation design activity raised. One of the more fundamental questions was about the implementation of ideation tools. How were they implemented and more importantly was the designer aware of why they are implemented? If the reason was for innovation, then how were design briefs helpful as anything other than guidance. With that said design briefs for complex issues can really only be guidance if the problem has not been engaged. Both of these observations were contrary to practice not only in that the designer distinguished between play and creativity and the actual design process when in fact creativity must be a part of the design process. Another problem was that there are such distinct lines between the client and the designer which until the process was at a breaking point such relationships are not built upon. How would the design process look if it started with good communication and greater possibilities? Incorporating instructions into or part of the brief since the brief was reviewed, underlined and often referred back to. Although paying participants did not preclude them from either wanting to leave early or shorten the time they were there a comparison with a non-paid group could be made for verification. There were varying degrees of commitment to the task more so with Group A than Group B, but in both cases they did not have the same pressure of employment. Based on the participation of Stephan in both groups another design activity would have been preferable to understand if the same results occur.

Expectation

While observations of the design activity video of PHASE I TESTING provided resources about how designers engaged the design activity unprompted, the design activity also revealed issues related to the participants' ability to role play and follow instructions therefore a comparison of ideation tools was made more difficult. A more effective comparison could be made if the instructions were followed in order to provide a more consistent process therefore I took the role of the designer to ensure that the instructions were reviewed. I had anticipated that the second phase could provide the research with resources where three tools can be administered as they were designed for the research.

Participant

The participants were not designers as it would facilitate role playing. Nikos Kontos and Giorgio Rondelli were

people I had known socially not professionally and they had volunteered as non paid participants.

Environment

The environment was left to the participants preference because they are providing a service and New Cross for both participants was not readily accessible.

Data

The data was collected in the same fashion. Envelops with the design brief were supplied, all ideas were recorded on post it note, questionnaires were provided after each test, an exit interview were conducted and all of it was video taped. Ideally the next phase will provide resources regarding role play, consistency in experience between the ideation tools, idea generation between the tools and incorporating different levels of familiarity with the participants.

Methods

The participants were aware and had consented in advance that these sessions would be video taped. They had also consented to carrying out all three design activities in tandem. The reason for this is that since they were not school based they were less able to schedule three tests while retaining a memory of their experience in order to have an effective exit interview to compare their experience with each of the tools which Group B Marian and Stephan exemplified.

PHASE II

Group C (Kevin and Nikos)

	Occupation	**Yrs. Experience**	**Sex**	**Familiar**	**Education level**	**Paid/Unpaid**	**Field**
Kevin	Designer	6	male	Yes	MPhil	Unpaid	branding, graphic
Nikos	Consultant	3	male	Yes	Meng Biochemical Engineering	Unpaid	New product development

Group D (Kevin and Giorgio)

	Occupation	**Yrs. Experience**	**Sex**	**Familiar**	**Education level**	**Paid/Unpaid**	**Field**
Kevin	Designer	5	male	Yes	MPhil	Unpaid	branding, graphic
Giorgio	Brand Strategist	2	male	Yes	Not answered	Unpaid	Brand Strategist

Group C (Nikos and Kevin) EiDOS Video notes

Questionnaire

Nikos

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions provided to you in the packet clear?	10	**How well did you know your partner?** I've known my partner for a long time.
2. How well were your ideas explored?	10	**How would you characterize the conversation?** Very friendly, casual, didn't feel like an exercise
3. Howe well were the ideas explored with your partner?	10	**In your own words was there any point where you felt your ideas started to flow?** I think the point when we were both more creative was when
4. Did the instruction help?	8	we started talking about 'futuristic' characteristics of a car
5. Were the ideas you generated creative?	10	**Was there anything standing out that inhibited or helped this process?** The fact that the conversation was very casual and on a topic that i've happened to have thought about in the past. **If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Maybe have a pc so you could actually design your ideas and see them on a screen **How would you describe the term ideation?** Creating ideas brainstorming **Is this process different or similar to your own as a client or designer? If so how?** It's not different

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions provided to you in the packet clear?	8	**How well did you know your partner?** Very well. Friends for 5 years.
2. How well were your ideas explored?	8	**How would you characterize the conversation?** Awkward, I kinda knew what was coming and the conversation didn't go that way. My expectation was hard to let go of.
3. Howe well were the ideas explored with your partner?	8	
4. Did the instruction help?	9	**In your own words was there any point where you felt your ideas started to flow?** Last part, existential.
5. Were the ideas you generated creative?	10	**Was there anything standing out that inhibited or helped this process?** Thinking, remembering dialogue rules **If there were 3 things you could change about this process of generating ideas for this competition what would they be?** More intuitive instructions or methods of how to guide. **How would you describe the term ideation?** Generation or formation of ideas/thoughts. **Is this process different or similar to your own as a client or designer? If so how?** Yes. Conflicted with the brief and also expanding the role almost became the primary issue.

Research notes

The EiDOS design activity was conducted a week earlier, but the video footage was lost and since the other tests hadn't been conducted, EiDOS was retested along with TRIZ and the placebo.

Group C (Nikos and Kevin) TRIZ Video notes

Nikos, didn't make any notes. He referred to his idea as being 'a totally stupid idea' and even within this context and being friends in a casual environment, it highlights the restrictions that we place on ourselves to verbalize our thoughts. He made a comment 'You cannot see what's in my head right now' which seems that it could solve many problems as far as communicating ideas and sharing ideas. His comment does highlight an obstacle to client and designer interactions given that both of us may not draw or may not have confidence in the ideas that we have or the point of the exercise when it is designer guided.

At 20 minutes Nikos stated he thought that the steps were difficult. In this activity it was more likely that we stated ideas that fell within the parameters of the current step instead of generating new ideas, or that we had no idea how they applied. I tried to get him to go through the rest of the process, but it was hard for me to do as well. They were coming out of left field and I spent more time trying to figure out how it applied that I was not concerned with how it could help catalyse more ideas. Some of the ideas were not written down as they were just discussed and the post it was overlooked. This occurred at least 4 times during this test, highlighting the difficulty of writing down an idea especially as it is being formulated or even being considered an idea.

Questionnaire

Nikos

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions provided to you in the packet clear?	10	**How well did you know your partner?** Very well
2. How well were your ideas explored?	3	**How would you characterize the conversation?** casual
3. Howe well were the ideas explored with your partner?	2	**In your own words was there any point where you felt your ideas started to flow?** Just during the first part when talking about the idea of a simple car
4. Did the instruction help?	0	
5. Were the ideas you generated creative?	0	**Was there anything standing out that inhibited or helped this process?** A lot of the questions don't relate to the design

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		If there were 3 things you could change about this process of generating ideas for this competition what would they be? Remove the steps **How would you describe the term ideation?** Same as before **Is this process different or similar to your own as a client or designer? If so how?** No

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions provided to you in the packet clear?	10	**How well did you know your partner?** 5 years
2. How well were your ideas explored?	0	**How would you characterize the conversation?** Non existent
3. Howe well were the ideas explored with your partner?	0	**In your own words was there any point where you felt your ideas started to flow?** no
4. Did the instruction help?	0	**Was there anything standing out that inhibited or helped this process?** All the steps
5. Were the ideas you generated creative?	0	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** No more steps

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		How would you describe the term ideation? Na **Is this process different or similar to your own as a client or designer? If so how?** Na

Research notes

The TRIZ steps for me to think about different aspects, I normally wouldn't come up with. In this respect TRIZ is quite useful, but often isolated me and Nikos in our own thoughts to try and understand either how it applied or how the ideas we had generated applied to the step. It did not help us to come up with ideas and did not allow me as a designer to guide the client when I struggled just as much to generate ideas given the steps.

Group C (Nikos and Kevin) Placebo Video notes

The last design activity went quite quickly as there was little guidance and very little communication.

Questionnaire

Nikos

ON A SCALE OF 1-10		IN YOUR OWN WORDS
6. Were the instructions provided to you in the packet clear?	10	**How well did you know your partner?** As before
7. How well were your ideas explored?	10	**How would you characterize the conversation?** As before
8. Howe well were the ideas explored with your partner?	10	**In your own words was there any point where you felt your ideas started to flow?** When we expanded on our original ideas
9. Did the instruction help?	10	**Was there anything standing out that inhibited or helped this process?** No
10. Were the ideas you generated creative?	10	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** No
		How would you describe the term ideation? As before
		Is this process different or similar to your own as a client or designer? If so how? No

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions provided	7	**How well did you know your partner?**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
to you in the packet clear?		same
2. How well were your ideas explored?	3	**How would you characterize the conversation?** Weird, sporadic
3. Howe well were the ideas explored with your partner?	4	**In your own words was there any point where you felt your ideas started to flow?** End
4. Did the instruction help?	5	
5. Were the ideas you generated creative?	8	**Was there anything standing out that inhibited or helped this process?** There wasn't a process
		If there were 3 things you could change about this process of generating ideas for this competition what would they be? Determine outcome
		How would you describe the term ideation? Na
		Is this process different or similar to your own as a client or designer? If so how? Na

Research notes

The video was an effective method of understanding how many ideas were generated as opposed to counting the post it's or when the participants were writing. This is due to the conversation where the participants were more engaged with the ideas and the flow of the conversation than with the parameters of writing down all the ideas. This also highlights the difficulty in writing down an idea that may still be forming or ideas that are either marginalized personally or by the partner. This video on two occasions, Nikos stated his ideas were stupid although he did voice them with this caveat.

Exit interview

Which session did you find the communication flowed better?

- Nikos – this one or the first one, because it's more creative and easier to relate to
- Kevin – the first one was the best

Which session do you believe yielded the most ideas?

- Nikos – the first one
- Kevin – the first one

Did you switch roles? If so why?

- Nikos - no
- Kevin - no

Which session do you believe was most creative?

- Nikos – the first one
- Kevin – the first one

Which session hindered your communication most?

- Nikos – number two
- Kevin – the second one

Which session was the least creative?

- Nikos – number two
- Kevin – the second one

What do you see as the purpose of the session?

- Nikos – to create ideas
- Kevin – generate ideas and figure out if I can guide the participant

What will you take from this design activity?

- Nikos – having two people create ideas
- Kevin - how do people generate ideas, how there is a difference between very strict and much more lax rules for generating ideas; it's complicated process and taken out of context when the participant really

a client, would they behave the same?

Were there any significant changes to your approach between each session?

- Nikos – not really
- Kevin – the second and third one I didn't guide because the

Have you used ideation tools before?

- Nikos - no, indirectly yes through brainstorming; previous information and prior presentation (new methods of showing the same information differently)
- Kevin - yes

Do you think they are useful and why?

- Nikos –yes, to help develop stories
- Kevin – yes, because they can aid in breaking mental habits

Summary of Group C activities

Having tested all three tools in succession instead of in different sessions created two main differences between Phase I and Phase II. The first is the potential for fatigue between sessions, especially after the 2nd test. The other difference is that as participants we can more accurately describe differences between the activities without much memory recall. Given that all three design activities are carried out in succession the role also becomes a relevant issue as participants in a design activity it is fine, but as a replication of a real design scenario the changes in the client from Ferrari and NIKE, Inc. would no occur during the same session unless they were representing the clients, which is not out of the realm of possibility. The participant and I also knew each other and much like professional relationships prior knowledge of each other is not unusual nor a deterrent.

While reviewing the footage, I was reminded of prior scenarios when going from one part of the design activity to another. At the beginning when ideas were generated in a much more free fashion and then either pragmatic, or probabilistic or existential parameters are applied, it seems natural or at least habitual to review the prior ideas and see if they apply, but then something different can happen apart from this when the conversation then goes into a different direction to generate more ideas, which is less common. This is noteworthy because the idea of the ideation tool is that pragmatic, probabilistic and existential contexts can be applied to generate more ideas not just as a classification of the existing ideas, but this is not inherent as a task nor is it inherent as a method to generate different ideas.

Notably Nikos mentioned that during his experience with the client that design problems were eventually addressed by bringing in the decision-makers to decide on final design concepts that otherwise would stall the

project as a whole. It brings up the significance of decision-makers during the ideation phase of the design process and who better than the designer to help guide them, eliciting ideas?

Group D (Giorgio and Kevin) EiDOS Video notes

At the beginning of the design activity there was an initial conversation and that went into a lull halfway through and the next step seemed to provide a link from earlier unrestricted conversation to the relevant current context. From that point we were able to move from the previous ideas and have a dialogue that generated more. The ability to write them down and be engaged in the dialogue calls into questions under normal circumstances within a studio how a designer can facilitate the conversation and keep track of their and what appears to be necessary in taking the clients ideas as well even though they are empowered to do so and have the materials.

Questionnaire

Giorgio

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	10	**How well did you know your partner?** Not very well
2. Were the instructions from the designer clear?	9	**How would you characterize the conversation?** Very intellectualized?
3. How well were your ideas explored?	5	**In your own words was there any point where you felt your ideas started to flow?** After latching on to an interesting idea that sparked others
4. Howe well were the ideas explored with your partner?	4	i.e. bespoke solutions, environmental impact etc
5. Did the instruction help?	6	**Was there anything standing out that inhibited or helped this process?** Inhibited – low articulation of actual needs in the world and
6. Were the ideas you generated creative?	7	the role of Ferrari in answering those needs helped – framework to direct the thinking (though a bit rigid)
		If there were 3 things you could change about this process of generating ideas for this competition what would they be? More specific company profile – what does Ferrari stand for?

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		Deeper articulation of the audience Move informal environment (i.e. write on boards, sit on sofa, chill!!!) **How would you describe the term ideation?** Sparking of new thoughts **Is this process different or similar to your own as a client or designer? If so how?** More structured more intellectualized less grounded in tangible facts lacking visual stimulation

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	10	**How well did you know your partner?** Not very well
2. Were the instructions from the designer clear?	9	**How would you characterize the conversation?** Formal
3. How well were your ideas explored?	7	**In your own words was there any point where you felt your ideas started to flow?** The end pragmatic and probabilistic
4. Howe well were the ideas explored with your partner?	6	**Was there anything standing out that inhibited or helped this process?** The client wanted a very function process, very formal.
5. Did the instruction help?	8	
6. Were the ideas you generated creative?	8	**If there were 3 things you could change about this process of generating ideas for this competition what would they**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		be? Loosen it up draw more elicit more ideas from the client **How would you describe the term ideation?** Generation of ideas, visual, mental, audible **Is this process different or similar to your own as a client or designer? If so how?** Not very similar; negotiation of practical and creative.

Group D (Giorgio and Kevin) TRIZ Video notes

During 9-12 minutes we are sharing ideas and generating ideas based around each of our ideas. A very difficult process to do and to guide the client through. We spent a lot of time contextualizing the actual steps and conformed the process to take care of issues we hadn't thought about. At 16 minutes he did not feel comfortable doing the design activity or feeling qualified to answer these type of questions. At 20 the client started reading it for clarity, but referred to his position and what his role actually is.

Questionnaire

Giorgio

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	10	**How well did you know your partner?** Same as before
2. Were the instructions from the designer clear?	9	**How would you characterize the conversation?** Same as before
3. How well were your ideas explored?	7	**In your own words was there any point where you felt your ideas started to flow?** Same as before
4. Howe well were the ideas explored with your partner?	6	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	8	(no answer)
6. Were the ideas you generated creative?	8	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Would be helpful to start the idea generation together and develop ½ more ideas more in detail **How would you describe the term ideation?** Same as before **Is this process different or similar to your own as a client or**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		designer? If so how? More academic theoretical more focused on detail and less on the bigger picture

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	8.5	**How well did you know your partner?** Not very 6-8 weeks
2. Were the instructions from the designer clear?	9	**How would you characterize the conversation?** Short dominated by process
3. How well were your ideas explored?	1	**In your own words was there any point where you felt your ideas started to flow?** No
4. Howe well were the ideas explored with your partner?	1	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	0	The 40 steps. The clients' perception of their role. Who comes up with ideas. A reoccurring theme re time of day.
6. Were the ideas you generated creative?	0	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Making it open accessibility from the language to the practical application. Differentiate between activities **How would you describe the term ideation?** Same as before **Is this process different or similar to your own as a client or designer? If so how?** Totally different, too scripted

ON A SCALE OF 1-10		IN YOUR OWN WORDS

Group D (Giorgio and Kevin) Placebo Video notes

The video was full and ended at the time we finished reading the brief and were past the second step of generating ideas on our own. We had just engaged each other in sharing the ideas we had. After this point we would generate some ideas together then split and generate ideas on our own. Lastly we would come back together and decide whether to continue or not and in this case we were satisfied with the ideas we had generated. I would estimate the process went on for another 5 minutes.

Questionnaire

Giorgio

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	10	**How well did you know your partner?** Same as before but a bit better
2. Were the instructions from the designer clear?	10	**How would you characterize the conversation?** Same as before
3. How well were your ideas explored?	6	**In your own words was there any point where you felt your ideas started to flow?** When brainstorming
4. Howe well were the ideas explored with your partner?	6	**Was there anything standing out that inhibited or helped this process?** The brainstorming was the most prolific part in terms of
5. Did the instruction help?	8	quality
6. Were the ideas you generated creative?	6	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** More brainstorming, more sharing, less formality **How would you describe the term ideation?** Same as before **Is this process different or similar to your own as a client or designer? If so how?**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		Same as before

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	8	**How well did you know your partner?** Same as before
2. Were the instructions from the designer clear?	8	**How would you characterize the conversation?** Ok
3. How well were your ideas explored?	5	**In your own words was there any point where you felt your ideas started to flow?** At the beginning
4. Howe well were the ideas explored with your partner?	6	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	0	Interest fatigue
6. Were the ideas you generated creative?	7	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Spacing, time, level of engagement **How would you describe the term ideation?** Same as before **Is this process different or similar to your own as a client or designer? If so how?** Similar in that it was a bit organic but I got the impression not as useful for the client their level of engagement was less.

Research notes

Exit Interview

1. Which session did you find the communication flowed better?

- Giorgio - 1st part, warmer compared to the 1st exercise which served as a warm up
- Kevin - 1st

2. Which session do you believe yielded the most ideas?

- Giorgio - 1st
- Kevin - 1st

3. Which session do you believe was most creative?

- Giorgio - 1st
- Kevin - 1st

4. Did you switch roles? If so why?

- Giorgio - (no answer)
- Kevin – I had the role of designer, but we collaborated as the tests went on.

5. Which session hindered your communication most?

- Giorgio - All 3 in different ways – formality and unfamiliarity
- Kevin - 2nd

6. Which session was the least creative?

- Giorgio - 3rd because of the overdone topic
- Kevin - 2nd too much lag time on each step to decipher and then try to expand

7. What do you see as the purpose of the session?

- Giorgio - Create a framework for idea generation
- Kevin – Collaborative idea generation

8. What will you take from this design activity?

- Giorgio - The importance of working collaboratively
- Kevin – The relationship that is established is as if not more important than the test. Each tool has a role in opening some access to the designer and the user.

9. Were there any significant changes to your approach with each session?

- Giorgio - Yes, more informal
- Kevin – I tried to relax

10. Have you used ideation tools before?

- Giorgio - Yes, didn't call them that though
- Kevin - yes

11. Do you think they are useful and why?

- Giorgio - Yes if they're not too formalised. There's a danger to paralyse the creative flow when sticking to rigidly to the different steps.
- Kevin – breaking mental habits and helps to get to know the client

Group C + D Summary

The design activity results were consistent in that EiDOS scored highest in cumulative numbers with the placebo while the both scored higher than TRIZ. These results are consistent with Group A and B results.

Group C and D tests affirm Group A and B results of significant gaps in measuring ideation tool effectiveness measured on the number of ideas that it catalyses or generates. The participants' experience is not properly accounted for and thereby the ideas that are generated are not as creative per the participants' feedback nor did they enjoy the design experience as it related to TRIZ. TRIZ is still the lowest rated ideation tool while EiDOS is rated highest. The tests suggest that the 40 steps of TRIZ is overwhelming and distracting from the creative process.

The most significant change was taking the uncertainty out of the testing such that the tools were being tested based on their steps as opposed to testing the ability of the designer to follow the activity. Doing this limits my ability to make significant comments regarding to best change the methodology of administering the tools but allows me to focus on taking the participant through each one as consistently as possible.

Expectation

Phase I and II testing were limited because there were a total of 6 different participants, therefore two more tests were arranged in order to provide more breadth in testing. Phase I testing began with two participants who did not know each other going through the testing process. What occurred was that the first group collaborated on the activities and did not follow the instructions creating a dynamic where the activity as a design activity was the focal point instead of the actual tools. A second design activity was designed where I participated and administered the tools to participants I knew either well or was at least acquainted with in succession during one session. The ideas generated (post-its) and the time of the design activity were significantly less, perceptions of the tools and the experience were consistent although. The primary reason for pursuing more testing was that during Phase I, Stephan was used in both tests. While this provides data regarding his process within the testing scenario, it may be helpful as the participants to conduct more. The next design activity is being designed to access more people within the design activity and outside the design activity to confirm that ideation and ideation tools are not well understood. While this may not be conclusive it will provide more insight regarding the connections between the participant, ideation, ideation tools and the design process. The tests thus far have focused on the design activity and the participants' ability to generate ideas within this context.

Participant

Ideally the participants would be similar and in the Group E both participants are designers. Group F, neither participants are designers.

Environment

Within the overall design of the research there was a desire for continuity in order to relate each design activity within each group and also between groups.Therefore it would be important that the environment, testing procedure and outcomes would be consistent. Given the real circumstances, compromises had to be made for location as the participants of Group E were reluctant to do the design activity in New Cross and preferred their studio and for Group F who are post graduates at Goldsmiths, it was not a problem.

Data

The next tests can provide more resources as to why EiDOS and the placebo score higher in the key areas of creativity and experience based on the users' experience.

Methods

Video taping the design activities, using post-it notes to record the ideas and presenting the design activities will remain the same.

PHASE III

Group E (Janko Matic and Kevin)

	Occupation	**Yrs. Experience**	**Sex**	**Familiar**	**Education level**	**Paid/Unpaid**	**Field**
Janko Matic	Artist and Graphic Designer	Fine arts 10 yrs Design 4 yrs	male	Yes	n/a	Unpaid	Graphic and web design
Kevin Spellman	Designer	7 yrs	male	Yes	Masters	Unpaid	Graphic design

Group F (Uzsalia Dimitriou and Kevin Spellman)

	Occupation	**Yrs. Experience**	**Sex**	**Familiar**	**Education level**	**Paid/Unpaid**	**Field**
Uzsalia Dimitriou	Architect	10	female	Yes	Visual cultures, PhD	Unpaid	Building
Kevin Spellman	Designer	7	male	Yes	Design, PhD	Unpaid	Graphic design

PHASE III

Group E (Janko and Kevin) EiDOS Video notes

Environment was a positive element (music and working in his studio). I had one copy of the instructions for this exercise so I read them after he did.

I provided him instructions on how to go through the design activity. There is a bit of discontinuity when I am running a design activity and then I pass it onto the designer to take over and take me through the process. It provides some insights regarding the difficulty in providing instructions for the design process.

I reflect that the need more information, but as an activity the instructions are adequate, but as a design process

Even though I had the role of the client, I was still transcribing his ideas and mine. At 21 minutes, I switched roles because he was going through the process internally but not guiding me through them.

At 30 we collaborated on the dynamics of a Ferrari for women and generated some really good ideas and left behind some ideas of who and what Ferrari is. A self parking Ferrari for women with a different aesthetic, smell, options for directions and destinations (38 min).

Even with the steps, I had to elaborate on what they meant.

Consistently I find myself taking notes and writing ideas down, but it doesn't clarify if the participant does not understand that they are or that it's my responsibility as a part of the activity or if it's important like the idea of roles in the design activity.

Questionnaire

Janko

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	5	**How well did you know your partner?** Well enough
2. Were the instructions from the designer clear?	10	**How would you characterize the conversation?** Entertaining, triggering
3. How well were your ideas explored?	10	**In your own words was there any point where you felt your ideas started to flow?**
4. Howe well were the ideas	10	Yes when I was “pulled” into the “story”. Not when I was given instructions.

ON A SCALE OF 1-10		IN YOUR OWN WORDS
explored with your partner?		
	5	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?		
	10+	Not having to take an initiative
6. Were the ideas you generated creative?		**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
	9	
7. How comfortable were you with the experience as a whole?		n/a
		How would you describe the term ideation?
		Something to do with generating ideas. But brainstorming works the same I guess.
		Is this process different or similar to your own as a client or designer? If so how?
		Not so much different to brainstorming
		Please list 3 things you felt comfortable with during the design activity.
		Not having to take initiative the whole process

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	8	**How well did you know your partner?**
		4 months
2. Were the instructions from the designer clear?	8	**How would you characterize the conversation?**
		relaxed
3. How well were your ideas	10	**In your own words was there any point where you felt your**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
explored?		**ideas started to flow?**
		Pragmatic stage
4. Howe well were the ideas explored with your partner?	10	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	8	Instructions for what he was supposed to do (but instead) he read them to himself and I took over to clarify the process
6. Were the ideas you generated creative?	10	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
7. How comfortable were you with the experience as a whole?	9	How do I get the roles and the designer to guide the client???
		How would you describe the term ideation?
		Generation of ideas
		Is this process different or similar to your own as a client or designer? If so how?
		No, not at the end although a great deal more rambling and trying to find social negotiating the process of the research and seeing it go to pot but not entirely sure why.
		Please list 3 things you felt comfortable with during the design activity.
		Collaboration, the environment (studio), exploring a familiar topic differently

Group E (Janko and Kevin) TRIZ Video notes

In this activity, we were starting off on a creative vein and then when I prompted Janko to use the instructions he felt very inhibited and we tried to sort out how the instructions fit with the way we were going or how they were relevant. It raises some concerns about the timing of when ideation tools are introduced, but like his comment at the beginning of the tape he had stated he was still thinking in the same vein as the last exercise so how does he know when or how to break out of this pattern. What does it feel like?

At 30 min he declared his favourite step as a design process is universality

At 40 we struggled to get beyond the steps to generate ideas. I had hit a wall as well.

At the end of the exercise I am doodling.

Questionnaire

Janko

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	7	**How well did you know your partner?** Well enough
2. Were the instructions from the designer clear?	10	**How would you characterize the conversation?** Not entertaining
3. How well were your ideas explored?	1	**In your own words was there any point where you felt your ideas started to flow?** Only the first step (brief)
4. Howe well were the ideas explored with your partner?	2	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	1	No. quite the opposite
6. Were the ideas you generated creative?	1	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
7. How comfortable were you with the experience as a whole?	2	Changing 3 things wouldn't be enough **How would you describe the term ideation?** n/a

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		Is this process different or similar to your own as a client or designer? If so how? Very different. To definite guidelines **Please list 3 things you felt comfortable with during the design activity.** Very uncomfortable with tasks too much "guidance" for the creative process more "closed" thinking than "open"

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	9	**How well did you know your partner?** Same
2. Were the instructions from the designer clear?	9	**How would you characterize the conversation?** Stifled
3. How well were your ideas explored?	1	**In your own words was there any point where you felt your ideas started to flow?** no/at the beginning reviewing the brief
4. Howe well were the ideas explored with your partner?	1	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	1	TRIZ
6. Were the ideas you generated creative?	1	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
7. How comfortable were you with the experience as a whole?	3	Not sure; the flow

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		How would you describe the term ideation? Same **Is this process different or similar to your own as a client or designer? If so how?** No **Please list 3 things you felt comfortable with during the design activity.** Music yes, instruction no

Group E (Janko and Kevin) TRIZ Video notes

He commented at the beginning that he was exhausted by second activity. He also wondered why the history of Nike was included.

In watching this there are questions about what is going when one person is writing and the other is listening or sharing ideas. It's difficult to keep up and engage with the other person when you playing catch up.

In the case of the placebo it was that we weren't interacting and that we are trying to generate ideas on our own. Janko tried to speak to me on16-18 and I refused.

Questionnaire

Janko

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	10	**How well did you know your partner?** Well
2. Were the instructions from the designer clear?	10	**How would you characterize the conversation?** Fun exploring-ish
3. How well were your ideas explored?	5	**In your own words was there any point where you felt your ideas started to flow?** Just at the beginning
4. Howe well were the ideas explored with your partner?	9	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	8	Communication
6. Were the ideas you generated creative?	5	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
7. How comfortable were you with the experience as a whole?	9	Not do it after 2 studies work on a fresh mind **How would you describe the term ideation?** n/a

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		Is this process different or similar to your own as a client or designer? If so how? n/a **Please list 3 things you felt comfortable with during the design activity.** 1. communication 2. tough challenge to work on

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	10	**How well did you know your partner?** Same
2. Were the instructions from the designer clear?	10	**How would you characterize the conversation?** Non existent
3. How well were your ideas explored?	6	**In your own words was there any point where you felt your ideas started to flow?** Not between us
4. Howe well were the ideas explored with your partner?	0	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	2	Partner was stuck in TRIZ
6. Were the ideas you generated creative?	4	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
7. How comfortable were you with the experience as a whole?	6	More a break between for the partner. Less pessimism and more energy

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		How would you describe the term ideation? Same **Is this process different or similar to your own as a client or designer? If so how?** Same **Please list 3 things you felt comfortable with during the design activity.** rapport with Janko, environment, no real guidance (Janko read through the instructions)

Research notes

Janko found it very difficult to maintain a role in the ideation testing. He stated that he guides the conversation with his clients, but acknowledged that he does not change his approach. He leads the client. This can be critical as he sees the client different from himself. While engaging with him during the testing, he was more prone to collaboration that keeping with the roles. In fact he stated that his ability to open us was dependent on my ability to open up and bring him into the process. At the end of the testing he stated that it was more my approach than the tools in generating ideas. This naturally brings up questions regarding a set of tools and the designer's ability to embody them in an approach that does not feel like jumping through hoops. I find that with the Placebo, there isn't any interaction or any topic to make us engage. We simply go through the motions even though the brief is interesting.

Exit Interview

1. Which session did you find the communication flowed better?

- Janko - 1st
- Kevin - 1st

2. Which session do you believe yielded the most ideas?

- Janko - 1st
- Kevin - 1st

3. Which session do you believe was most creative?

- Janko - 1st
- Kevin - 1st

4. Did you switch roles? If so why?

- Janko - We did but we did it simultaneously when I changed the role.
- Kevin - it was difficult since he did not include me in the process and Janko was under the impression I knew what was going on.

5. Which session hindered your communication most?

- Janko - 2nd, there was no communication
- Kevin - 2nd

6. Which session was the least creative?

- Janko - 2nd
- Kevin - 2nd

7. What do you see as the purpose of the session?

- Janko - Trigger ideas more efficiently
- Kevin – collaborative idea generation

8. What will you take from this design activity?

- Janko - Not sure, I don't know. There were some parts that helped, but I think it was more you than the study that triggered the ideas. When you took the initiative. You trigger and you stayed in the background.

9. Were there any significant changes to your approach with each session?

- Janko - My approach was the same, and I think that was my problem. I don't know if I made good use of the studies.
- Kevin - The last one I could relax since you (Janko) went by the instructions but prior to that I was tense and unsure if I should intervene.

10. Have you used ideation tools before?

- Janko – No.
- Kevin - yes

11. Do you think they are useful and why?

- Janko – N/A
- Kevin – yes, to break mental habits

Additional questions on video:

What was it about the session that made them more comfortable?

(Janko) it was kind of a game using different obstacles. The post it notes, the colours and you don't feel you have to fill up the paper. If you had A4 then you have all the empty space. The steps don't force to develop it all in one step.

(Me) the lighting, the music and the environment and almost unnerving I was distracted.

PHASE III

Group F (Uzsalia and Kevin) TRIZ Video notes

It was the first time I explained what a design brief was. It was also less formal as she was visibly not interested in the testing formalities. This is the only design activity where TRIZ went first, Placebo second and EiDOS was third. Uzsalia's first language is Greek so the conversation needed to be clarified at times, but generally good. This does become an issue when it's combined with a foreign process like and ideation tool and TRIZ where the words of the steps are difficult like segmentation for example. Most of her ideas were verbal and so I started writing them down. I wouldn't normally do this as a client but I wanted to ensure the ideas were recorded. I am out of the picture and I cannot clearly see me writing my ideas down which affects the ideas count. During the conversations we collaborated and generated ideas together but they were narrowed by the ideas that she offered after she read the instructions. Between each step I was left to myself without guidance or real purpose.

The design activity can be generally characterised by Uzsalia reading the brief generating ideas then verbalizing these ideas to me and me trying to draw more ideas from them by using examples where they may be applied in other areas. This is one weakness of the process where I am looking to expand the process instead of really being a part of the process. She commented on the complexity of keeping the roles but that we weren't really able to since we were coming up with ideas together.

Questionnaire

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	1	**How well did you know your partner?** 2 months, well enough
2. Were the instructions from the designer clear?	2	**How would you characterize the conversation?** Sporadic
3. How well were your ideas explored?	2	**In your own words was there any point where you felt your ideas started to flow?** Not really
4. Howe well were the ideas explored with your partner?	2	**Was there anything standing out that inhibited or helped this process?** She didn't know the instructions so she read them used the

ON A SCALE OF 1-10		IN YOUR OWN WORDS
5. Did the instruction help?	0	ones she could but didn't communicate the others to me or ask me to contribute. More than likely it's also that guidance as the client was difficult.
6. Were the ideas you generated creative?	4	
7. How comfortable were you with the experience as a whole?	7	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Incorporate me into the process she had prior knowledge of the tool or brief more conversation **How would you describe the term ideation?** Generating ideas **Is this process different or similar to your own as a client or designer? If so how?** Yes and no I can be lead and sit back but that wasn't my expectation **Please list 3 things you felt comfortable with during the design activity.** Uzsalia not guiding the process music

Uzsalia

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	9	**How well did you know your partner?** I have seen him 4 times in class
2. Were the instructions from the designer clear?	9	**How would you characterize the conversation?** Interesting

ON A SCALE OF 1-10		IN YOUR OWN WORDS
3. How well were your ideas explored?	9	**In your own words was there any point where you felt your ideas started to flow?** From the start
4. Howe well were the ideas explored with your partner?	9	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	9	The instructions
6. Were the ideas you generated creative?	8	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
7. How comfortable were you with the experience as a whole?	9	Incorporate instructions that they investigating also improbabilities **How would you describe the term ideation?** Not very clear **Is this process different or similar to your own as a client or designer? If so how?** Yes, this is more organized **Please list 3 things you felt comfortable with during the design activity.** Brainstorming communication drawing inspiration from apparently no so directly relevant concepts

Group F (Uzsalia and Kevin) Placebo Video notes

The idea generation started very quickly with little time spent on the brief. The first ideas written down were in the 3rd minute.

Questionnaire

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	5	**How well did you know your partner?** Well enough
2. Were the instructions from the designer clear?	4	**How would you characterize the conversation?** Short
3. How well were your ideas explored?	5	**In your own words was there any point where you felt your ideas started to flow?** **No**
4. Howe well were the ideas explored with your partner?	2	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	4	Brevity
6. Were the ideas you generated creative?	4	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
7. How comfortable were you with the experience as a whole?	5	Engagement **How would you describe the term ideation?** Same **Is this process different or similar to your own as a client or designer? If so how?** Not really; no exploration **Please list 3 things you felt comfortable with during the**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		design activity. Helping with AIDS awareness product marketing partner/topic of sex

Uzsalia

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	7	**How well did you know your partner?** Some minutes more than design scenario 2
2. Were the instructions from the designer clear?	8	**How would you characterize the conversation?** Funny and pleasant
3. How well were your ideas explored?	8	**In your own words was there any point where you felt your ideas started to flow?** After communication
4. Howe well were the ideas explored with your partner?	8	**Was there anything standing out that inhibited or helped this process?**
5. Did the instruction help?	6	Discussion
6. Were the ideas you generated creative?	6	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
7. How comfortable were you with the experience as a whole?	9	Have more instructions like design scenario 3 more info about the design product possibilities **How would you describe the term ideation?** The same as before, I don't quite get it **Is this process different or similar to your own as a client or designer? If so how?**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		I don't understand this process very well **Please list 3 things you felt comfortable with during the design activity.** Talking and communicating being relaxed about the words sex and condom

Group F (Uzsalia and Kevin) EiDOS Video notes

Uzsalia made a comment that having roles is not very clear because the client would be more pragmatic and 'would say forget about it, it would not sell and the designer would be making crazy ideas.' It seems to be a critical view of who they are and their roles. This perception is difficult to overlook as collaboration is a key factor within the tenet of the tool. I felt like a secretary as I was writing ideas down for both of us which I found distracting.

After the orientation she mentioned that we have already come up with ideas, therefore the step was completed. I had to point out that the ideas we stated are the ones we came into with. The other more predominate aspect of this activity was that we debated ideas as opposed to collaboration. This was based around transforming public transport and the introduction of a Ferrari type of transportation. It became pragmatic based on problems with tracks, strikes, delays and suicide. It became a more defensive conversation.

Concluding the design sessions was not consensual they were more that she declared she didn't have any ideas and I conceded that we were done. In many cases I could have gone in each of the sessions.

Questionnaire

Kevin

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	10	**How well did you know your partner?** Well enough
2. Were the instructions from the designer clear?	10	**How would you characterize the conversation?** A bit conflicted we still debated the validity of some ideas
3. How well were your ideas explored?	6	**In your own words was there any point where you felt your ideas started to flow?** At the beginning but as more ideas were supposed to be
4. Howe well were the ideas explored with your partner?	6	generated the more past references were brought up
5. Did the instruction help?	7	**Was there anything standing out that inhibited or helped this process?** Communication inhibited I felt uncertain to keep making
6. Were the ideas you generated creative?	5	ideas that would be shot down

ON A SCALE OF 1-10		IN YOUR OWN WORDS
7. How comfortable were you with the experience as a whole?	5	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?** Adhere to the tenets more designer/partner interaction/enthusiasm food **How would you describe the term ideation?** Same **Is this process different or similar to your own as a client or designer? If so how?** It's a conflicting **Please list 3 things you felt comfortable with during the design activity.** Partner (rapport) topic music

Uzsalia

ON A SCALE OF 1-10		IN YOUR OWN WORDS
1. Were the instructions for the design activity clear?	9	**How well did you know your partner?** Some time more than previous design scenarios
2. Were the instructions from the designer clear?	9	**How would you characterize the conversation?** Challenging
3. How well were your ideas explored?	9	**In your own words was there any point where you felt your ideas started to flow?** After step 1
4. Howe well were the ideas explored with your partner?	9	**Was there anything standing out that inhibited or helped**

ON A SCALE OF 1-10		IN YOUR OWN WORDS
		this process?
5. Did the instruction help?	7	The idea to think about Ferrari in unusual terms
6. Were the ideas you generated creative?	7	**If there were 3 things you could change about this process of generating ideas for this competition what would they be?**
7. How comfortable were you with the experience as a whole?	10	Maybe incorporate another more "generic" car company **How would you describe the term ideation?** Unknown **Is this process different or similar to your own as a client or designer? If so how?** Similar in terms of communication different in the type of production **Please list 3 things you felt comfortable with during the design activity.** clear instructions nice conversation the probabilistic contextual

Exit Interview

1. Which session did you find the communication flowed better?

- Uzsalia - 1st
- Kevin - 3rd

2. Which session do you believe yielded the most ideas?

- Uzsalia - 1st
- Kevin - 3rd

3. Which session do you believe was most creative?

- Uzsalia - 1st
- Kevin - 3rd

4. Did you switch roles? If so why?

- Uzsailia - No, yes, not clear
- Kevin – Yes. During the first test, she was reading the instructions to herself and I was not involved at all.

5. Which session hindered your communication most?

- Uzsailia - **2nd**
- Kevin - 1st

6. Which session was the least creative?

- Uzsailia - 2nd
- Kevin - 1st

7. What do you see as the purpose of the session?

- Uzsailia - Tools to enhance creativity
- Kevin – generate ideas collaboratively

8. What will you take from this design activity?

- Uzsailia - Like the questionnaire 1 and 3rd instructions
- Kevin – The order the tools are used impacts the interaction.this partner liked TRIZ even though it was the least collaborative.

9. Were there any significant changes to your approach with each session?

- Uzsailia - Relaxed from first (design activity)

- Kevin – Yes, I tried to interfere less and let her guide the process.

10. Have you used ideation tools before?

- Uzsailia - No, never (alcohol/drugs)
- Kevin – Yes

11. Do you think they are useful and why?

- Uzsailia - Yes, comfort zone. Relax brain and know the person
- Kevin – Yes as a means of self awareness.

Note:

order of creativity and communication (1,3,2)

Group E + F combined results

Research Notes

Group E was conducted similarly to Groups C and D in that they were conducted at the participant's studio/home, all activities were conducted in one testing session and they were video recorded. The order of the activities were changed for Group F so that the order was TRIZ, placebo and EiDOS. This allowed me to observe any significant differences in order or context in subject matter. The feedback differed as the participant was excited about using Ferrari twice and had wanted the company to be consistent throughout as opposed to including the Nike design brief. The participant's creativity and idea exploration ratings were not very different from the prior tests suggesting that the order did not play a significant role in the evaluation. At this point I am satisfied with the data that has been gathered in testing to conclude the testing at this point based on resources and the time needed to analyse the videos to develop the next steps.

The goal of increasing the *UK* or the ideas that the client and the designer know they don't know or what could be considered a new synthesis. Within Groups A and B this was difficult because they did not follow the instructions. They did however provide resources regarding two types of iterations. The iterations are defined within this research as possibilities and pragmatic iterations. The iterations of possibilities are iterations that result through conversations and the use of ideation tools between two people (either client and designer) where the familiar territory meets the ideation tool and the ideation tool catalyses the conversation and it goes into a different direction. The iterations produced either *uk* (creative or innovative based on the new synthesis and risk taking characteristics) or *kk* (knowing what you know; Ex: your name, place of birth and favourite food). Observing the ideations, *uk* was more present in EiDOS than in TRIZ and reflected in the participants comments that they found it more creative and supports the Bauhaus observation that "free play in the beginning develops courage" (Bauhaus 1919-28, p. 116) (Bredendieck, 1962 pp. 18)

The numbers produced for the research provide only limited insight into the process. While the numbers reflect within the group sections that they may have created more ideas on the whole with TRIZ, there is nothing to state whether the participants self assessed quality of communication or creativity is at all related. The current design approach would support TRIZ as an effective method of generating ideas, but for effectively addressing complex problems the research supports EiDOS.

While Ross provided methods of comparing ideation tools, his method stops short of comparing them and he moves on to developing his own ideation tools. Within his criteria he uses a metaphorical distance (i.e. the distance they take the thinking away from the problem) and number of steps (i.e. the steps involved in creating the idea). In this case EiDOS is most closely related to 'Invention heuristics' such that it is a guide to help designers through particular types of problems like TRIZ (Ross 2006 pp. 123). Ross stops short of analysing other ideation tools and uses this categories to formulate his own approach. If this process is used by other designers or researchers they can compare EiDOS alongside their ideation tools as EiDOS has 5 steps and uses the context of pragmatism, probabilism, and existentialism to create a metaphorical distance. The core of the analysis occurred throughout the research process in the form of reflection and the design and development of strategies to obtain useful information. The research outcomes based on the statistical information that was generated is considered weak based on the amount of data that was produced. Hage provides research regarding research and the connection to rates of innovation. He stated that the greater the number of innovations the more consistent the findings (Hage, 1999 pp. 600)[xlviii]. Taken in context to this research where the participants felt EiDOS was more creative there is a conflict between the rate of innovation and the experience. The data did provide two conflicting pieces of information regarding the participants rating of creativity and expressing ideas and the number of post-its generated. They do not coincide where TRIZ may have generated more post-its, it was EiDOS that was considered most creative and where the participants felt they had expressed their ideas the most. The ideation tests suggest new areas of research in generating more effective collaboration between the client and the designer in addition to the data regarding ideation loops and challenges for designers using

ideation tools may not have occurred simply based on the number of ideas produced. The ideation tool testing has shown that communication and creativity from the perspectives of the participants has been improved and in comparison to TRIZ and a placebo is seen as superior and brings the findings more in line with Moore and Khol who analysed their participants words to describe their experience (Moore and Kohl, 2007).

Expectation

Based on the results of the ideation tests, I am incorporating an additional method of interpreting the participant's 'In your own words' responses. The reason for this is that the Wordles, arrangement of words by size based on frequency in a text, provide a visual canvass describing their experience through linguistic association that visually give data without a deeper heuristic analysis.

Participant

The text is taken only from the participants who completed the 3 design activities.

Environment

Wordles are completed through an online link (http://www.wordle.net/).

Data

The data will be from the section 'In your own words' using the following 7 questions from the participant questionnaires:

1. How well did you know your partner?
2. How would you characterize the conversation?
3. In your own words was there any point where you felt your ideas started to flow?
4. Was there anything standing out that inhibited or helped this process?
5. If there were 3 things you could change about this process of generating ideas for this competition what would they be?
6. How would you describe the term ideation?
7. Is this process different or similar to your own as a client or designer? If so how?

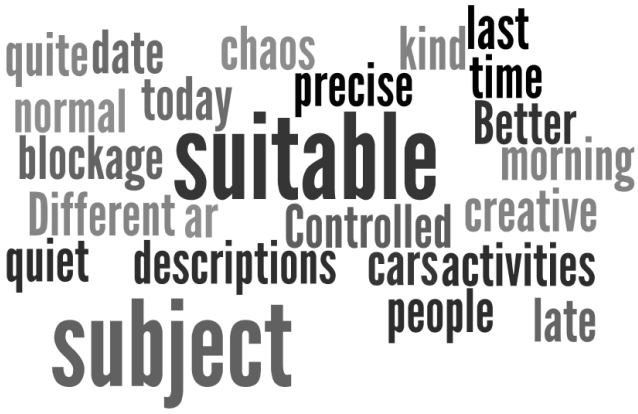
Methods

The text is entered from the participant's questionnaire into the form, formatted according to the user's preference and then screen captured to a graphic file.

Stephan (with Faith)

Eidos

TRIZ



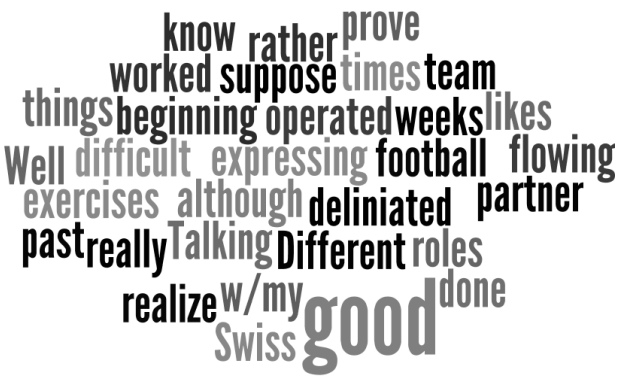
Placebo

Faith

EiDOS

TRIZ

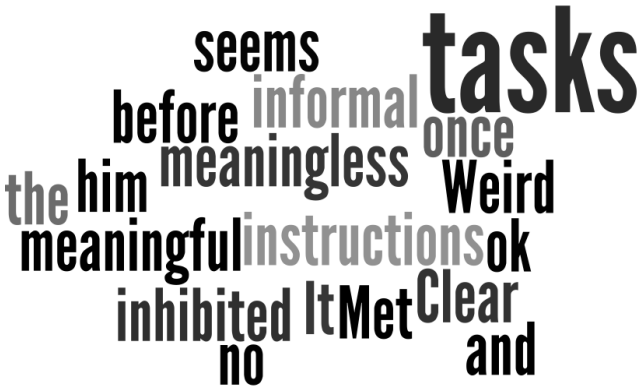
Placebo



Marian

EiDOS

TRIZ

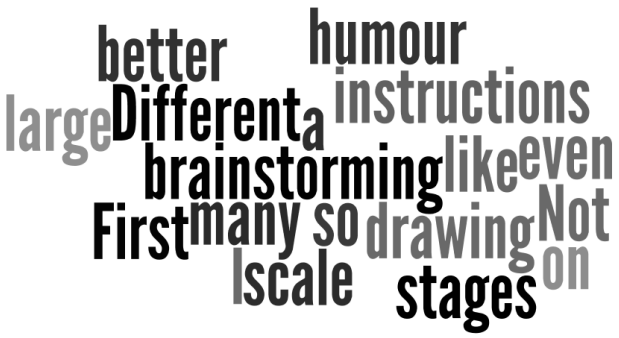


Placebo

Stephan (with Marian)

EiDOS

TRIZ

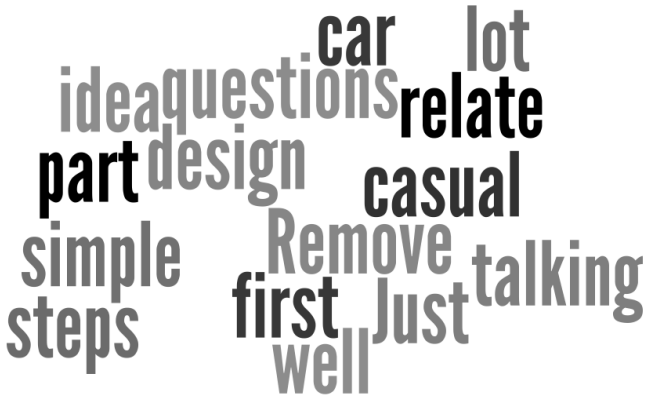


Placebo

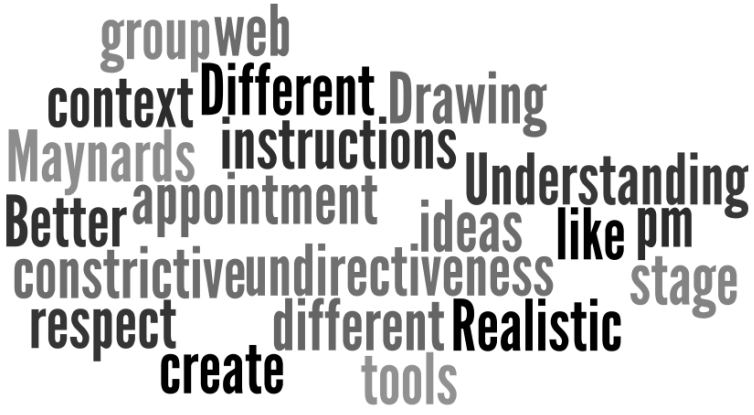
Nikos

EiDOS

TRIZ



Placebo

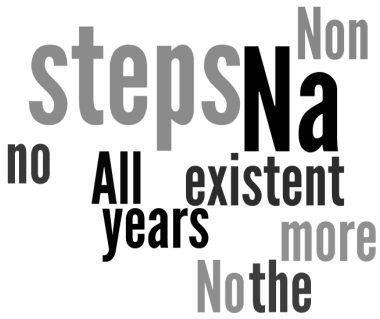


No our As
When before original
we ideas expanded on

Kevin (with Nikos)

EiDOS

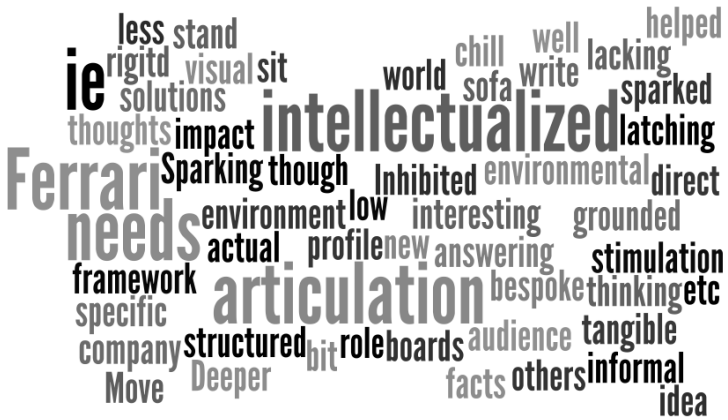
TRIZ



Placebo

Giorgio

EiDOS

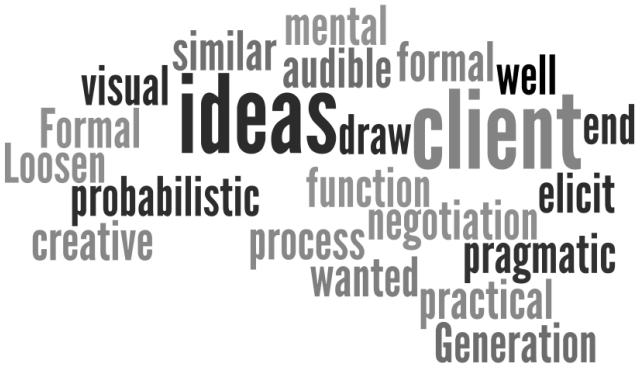


TRIZ

Placebo

Kevin (with Giorgio)

EiDOS

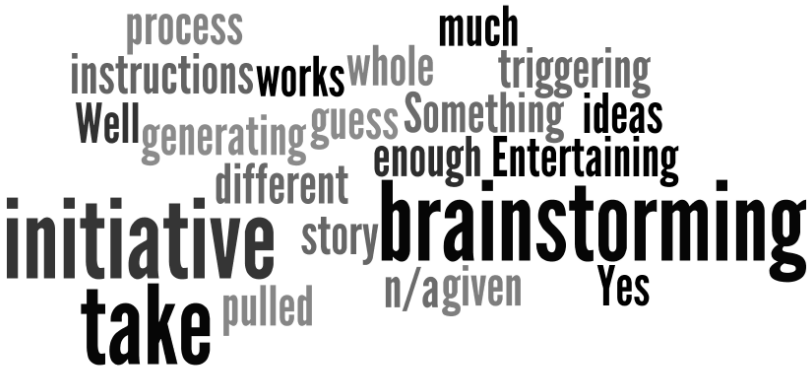


TRIZ

Placebo

Janko

EiDOS



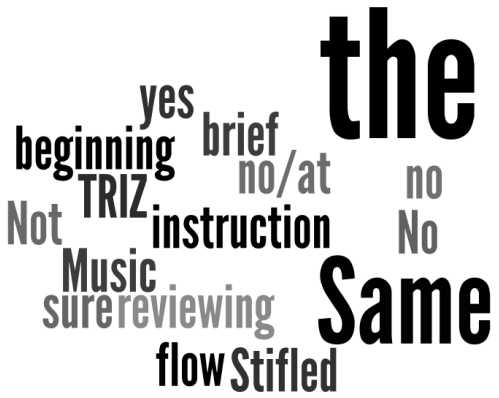
TRIZ

Placebo

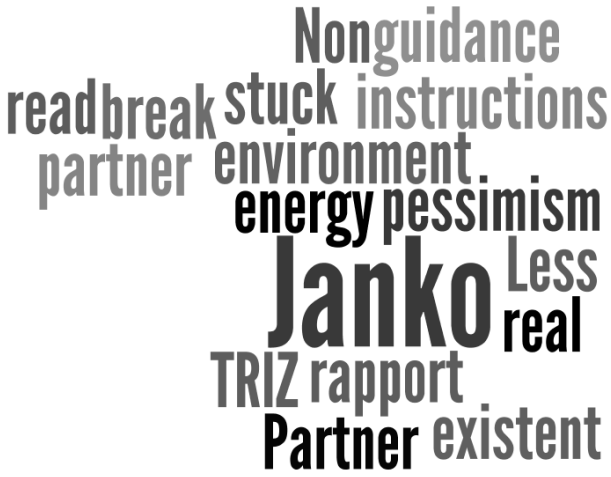
Kevin (with Janko)

EiDOS

TRIZ



Placebo



Uszalia

EiDOS

TRIZ

Placebo

Kevin (with Uszalia)

EiDOS

TRIZ

Placebo

EiDOS wordle

TRIZ wordle

Placebo wordle

The Wordles provide useful resources especially when they are combined. The individual Wordles provide some glimpses to the way participants are describing their experience like ideas shows up for EiDOS while steps is prominent for TRIZ and there are not real discriminating words that reappear for Placebo. This is in line generally with their feedback during the exit interview. In the ideation tool Wordles, EiDOS had ideas and design, TRIZ had steps and different and Placebo had brainstorming as the largest words.

Expectation

While the Wordles are visually interesting and give a different if not literal linguistic representation of their experience I wanted to a more general approach. After testing I had some lingering questions regarding ideation tools and if people knew what ideation tools were, if they used them in their own practice whether they were designers or not, if they would use a tool that helped them generate ideas with their clients and what if any issues they saw with using one. All in all is there any point in developing a tool no one would use?

Participant

The query was a general one to elicit knowledge from designers and non-designers therefore an open forum. I solicited my Facebook friends who have a range of occupations and familiarity (1 month to 20+ years).

Environment

The environment will be web based, because it is easy access for the user and for me to access the results quickly.

Data

The questions will be a combination of yes/no and short answers.

Methods

I will use an online survey using www.surveymonkey.com. It is a free service and has a short set up time.

Results

The results are downloadable and since there is a limit of 10 questions on the free account, I can focus and retrieve information without inconveniencing the participants or getting bogged down in data overload.

A web survey was conducted for participants and non participants in order to clarify what if anything people know about ideation tools and how or if they used them.

I asked the following questions of the people who took part in the design activities and my friends on Facebook.

1. What is your job title(s) and what company(ies) do you do it for?
    - There was no majority occupation or employer (teacher, researcher, architect, IT, purchasing, consulting, engineering, designer)
2. Did you take part in the design research activity testing ideation tools?
    - Out of 24 respondents - 5 yes (24.0%) and 18 no (76.0%)
3. How would you describe ideation?
    - Out of 24 respondents - 8 stated they did not know. There were lots of variations that had to do with creating ideas. One respondent stated 'Not sure, only seen the IBM ad'
4. If ideation is defined as a method of developing and generating ideas, either visual, verbal or written, how would you rate the importance of ideation during your problem solving process?
    - 52.2% stated that it was critical while 26.1% found it very useful with 17.4% in between.
5. Do you ideate the most alone, with a group or both?
    - ¾ of the respondents stated that they ideate both in groups and alone. 21.7% stated that they ideate strictly alone while no one stated they ideated in groups only.
6. Do you use ideation tools during your practice? (i.e. brainstorming, mind mapping, sketching, building)
    - 87.0% or 20 respondents said they use ideation tools in practice and 19.0% or 4 respondents said they don't. Unfortunately this contradicts the information regarding how many people stated they knew what an ideation tool was.
7. Do you use ideation tools and if so, how often do you find yourself using them?
    - 8.7% respondents stated that it Does not apply, 13.0% said they never use them, 34.8% of the respondents stated sometimes with an equal amount of 34.8% saying they did all the time and 8.7% stating they had no clue what you are talking about.
8. What ideation tools, if any do you use with your clients?
    - The majority of respondents fell into three categories. They either did not have clients per se,

they did not use ideation tools or they did use ideation tools but modified it's use to curb the possibilities unless they are working alone.

9. If there was an ideation tool designed to help you generate ideas with the client would you use it?
    - Based on the last question about how they use ideation tools, the next response was surprising. 91.3% said they would use a design tool while only 8.7% said they would not.
10. What are, if any, reservations you might have for using and ideation tool with a client?
    - The respondents main concerns were about how applicable it would be to their work, their client's reaction, setting limits for the client and time constraints.

Results

There is conflicting information regarding this sample. In one case there is over 90% stating that they would use an ideation tool that was designed to aid them with their client but 40% would only use it sometimes or never. If ¾ of the respondents use ideation tools both in groups and alone but only 34 percent actually use them all the time, the impact could be very limited.

This is helpful because it shows generally that there is a perception that ideation tools are useful but not how they apply to their work. It also indicates the type of user that could be helped by using an ideation tool. This demographic is mixed because there are 34% who use an ideation tool all the time, therefore they will not have to be persuaded that a tool is needed. By all accounts over 90% believe that an ideation tool is helpful. This leaves a group that sees the use but are not sure how it applies. This presents a great opportunity for the users who have reasons to use it, to incorporate it into their practice, regardless if they are designers or not.

DISCUSSION AND CONCLUSIONS

This research identified a gap in ideation tools for designers to collaborate with their clients during the ideation phase to catalyse possibilities to complex design problems as the contribution to new knowledge. The following statements are made as findings from the research.

The research concludes that designers and clients may not have sufficient knowledge of ideation or ideation tools in either testing or practice as a catalyst for generating possibilities.

1. During Phase I testing with Stephan Bischoff, who went through the process twice, as designer and client. The ideation tool/design activity changed from an exercise of generating ideas per the activity into reducing the ideation tool into his mental habits. (Chapter 4, Testing and Analysis)
2. During Phase I, II and III testing the participants (designers and non designers) were clearly trying to conduct a whole design process. This reaffirms Jin and Chusilp in their definition of design ideation and that it is a matter of developing and refining instead of developing and unfolding (Jin and Chusilp 2006 pp.27) (Chapter 4, Testing and Analysis)
3. An online survey was conducted in addition to the surveys of the design activity revealed 63.2% thought ideation was critical only 33.3% use ideation tools in practice with over 20% stating they either never use them or they don't apply in their professional practice. (Chapter 4, Testing and Analysis pp. 293-294)

The research concludes measuring ideation tools based on how many ideas they catalyse or generate is misleading because it relates creativity and idea generation and does not adequately consider the participant's experience.

1. This research assumed that Ross, Briggs and Reinig were correct in relating the relationship between creativity and the number of ideas produced, but the video footage and questionnaires of Phase I, II testing (research) suggests that the experience of the participants (designer and non designer) is more critical than the amount of ideas that are generated.

This research suggests that cultural perceptions of design ideation and the design process actively inhibit idea generation.

1. Phase I, II and III testing suggests the participants' perception of design and ideation were such that collaboration was evident as client and designer roles were less natural but the participants still held the belief that clients or designers would behave differently according to how they 'think' and

what they would want to do. (Chapter 4, Testing and Analysis; Chapter 1, Introduction)

2. Voice recordings made during the ideation phase of the Moixa Energy practice led research supports the client's perception that there was no difference between the design phase and design ideation and that a hands on iteration was more useful. (Chapter 2, Confirmation pp. 33)
3. Voice recordings made during a presentation to The Big Picture supports the cultural perception that ideation is a designer's process and the designer's perception that ideation and the ideation phase are not a design process that does not actively include the client. (Chapter 2, Confirmation pp. 57)

This research suggests a shift from design outcome led ideation tool design to designing ideation tools that engage design contexts is necessary to effectively address complex design problems.

1. Phase II, II testing and I (Chapter and Confirmation (Chapter 2, pp. 16) confirm that the participants were more concerned with the design outcome that affirmed design iteration within the ideation phase to refine instead of explore ideas The participants often reviewed their ideas in relation to the ideation tools instead of generating ideas with within 5 minutes of the activity. (Testing and Analysis, Chapter 4)
2. Phase I, II and III testing all support the occurrence of two iterations that were recognized during all testing Phases where the participants came to a step and if they related to it (experience, interest or catalysed new ideas) but the predominance of Concept Reuse is recognized as inhibiting collaboration, dialogue and creative idea generation(Jan and Chusilp 2006). (Chapter 4, Testing and Analysis)

This research suggests that the creative ideas generated mainly at the beginning of the design activity may have inherently creative qualities but alone they are not enough to effectively address design complexity.

1. Phase I, II and III design activity participants applied ideas they generated to steps in both EiDOS and TRIZ that should have and could have generated more ideas by addressing context.
2. Based on the target ideas and the results from Phase I, II and III where Jan and Chusilp design iteration Concept Reuse was dominant, the inability of working through this phase is recognized as inhibiting collaboration and idea generation(Jan and Chusilp 2006).

This research supports an active incorporation of practice led and empirical research as a process of ideation research.

1. Reflection in action is a powerful research tool that makes the research and practice more relevant to each other. While there are constraints based on resources and time for PhD research, the benefits are that it does not isolate design ideation as a practice and theoretically based research that benefits from the talk back.
2. This is evidenced by the feedback from Moixa Energy, Symbian, The Big Picture, Oxford University, Glasgow University, UCL, and designers who helped challenge the relevance and provided essential feedback regarding their own design and non design related experience.

A review of the methodological approach

The summary of methods and methodology is broken down into three sections. The first section is an explanation of the intentions and context of the first methodological approach that was scientifically focused. The second section builds on the consequence of the first section resulting in integrated methodological approach using a framework of the actual writing. Lastly, is a summary of the methods used during the practice led research, voice recordings, design activities and surveys. The reason for an unconventional approach was that there were few methods that accommodated questions regarding why the ideation tool was designed the way it was. This led to a critical aspect of the research vis-à-vis by changing the role of the ideation tool and ideation in the design process it became possible to change the role of ideation and ideation tools in design. This meant that ideation tools could change from making the design process for efficient to making the design process more effective. I have used a non-conventional approach in comparison to prior ideation research by combining practice, epistemology and protocol analysis of design activities. Each area is considerable in its own right with the amount of complex information it produces. They contribute to the whole of the research by exemplifying contradiction and practicality between different fields of knowledge and within design practice. In essence, by going the long way around and providing foundations of meaning to the applicable terms and incorporating the context of practice and philosophy, something unexpected occurred. While doing this, methods were employed that facilitated the outcomes but they are not linked sequentially as a planned map of progression except in the most general terms: literature review, practical inquiry, testing and analysis.

Framing the phenomena of ideation within the Cartesian mentality of pragmatic design processes

I believe design is a pragmatic process where the worth of an idea is represented by the design. Buchanan wrote that pragmatism in design is a method or discipline of analysis that may contribute to design thinking (Buchanan 1992). I don't fully agree based on the economic context that design functions within. It is hard to acknowledge and appreciate the contributing parts when the over all process can be economically and intentionally driven. This leads to my next point that, is in my opinion, there is a Cartesian separation of the mind and of matter when framing the process of ideation as a novel, creative phenomena within the context of economy. That is to say an intentional or purposeful combination of creativity plus a design brief should realize a novel actualization of the design brief is flawed. Constraining creativity and unpredictability within the

context of the design brief has been defended and even a basis for defining design. I contend the design brief is very useful if not necessary to understand parameters of the problem. I do however think when the design brief, client or designer have their mind made up about the outcome of the design process before engaging it, design thinking contributes to a strange loop or you end up where you started. I initially pursued a scientific methodological approach that would speak the scientific language of authority in hopes of exposing this paradox. Science is the critical construct in which we base our concept of reality. It's a self fulfilling prophecy where the ideas are realized, explored and substantiated by science. This all occurs while science cannot account for some of the most important elements of ideation that are creativity and cognition. It is ironic that these two key elements are growing ever more subservient to our technocratic society. Ironically, I believed by 'speaking the same language' I could develop a tool to help by incorporating the paradoxes that could justify the need for greater possibilities. Quantum theory and chaos theory are theories but phenomena and cognition occur everyday, the challenge was to expose the overlap.

This section was an initial and limited philosophical literary extrapolation of classical science, quantum and chaos theories being used in the phenomenological and cognitive function of design ideation. When approaching design problems from the perspective that the process can be a straightforward problem i.e. 1+2=3. I was concerned this approach may not work on complex design problems that are unpredictable and involve phenomena. The number 1 may actually be closer to 1.000003 or .9999 and adding the number 2 may actually be 2.000001. Together they might equal three, it might equal 3.00001, 2.91, 2.99998, 2.99999 and so it does equal 3 and not equal three at the same time. While ignoring Badiou's philosophical question of what number 'is' the different states of ideation relate to variations in the number and a possible misinterpretation of the significance of the infinite possibilities within the phase space that is ideation. Ultimately, the .91 and .00003 do matter to systems like design that are susceptible to small changes at the beginning resulting in very different outcomes. Generally speaking, I am challenging much like Bateson in *Steps to an Ecology of Mind*, the role of ideation in the design process as a probabilistic or predictable process to address complex design problems (Bateson 1973). The comparison is not a new but, what eventually emerges is a much larger conflict to reconcile classical mechanics, Quantum theory and the paradox unpredictable phenomena. I have received criticisms about this aspect of my research and the question regarding 'What does quantum theory have to do with ideation and what can you do with it?' is inevitable. Generally, when I explain it verbally they get it although they may not be convinced. It's a very dense and unresolved mess but let me try to clarify it in relation to the role ideation, ideation tools in the design process and the design process in the context of economy.

The first layer is to state we are not objective in thought. We are living in a technocratic and science based society. Without acknowledging this very basic fact, we are left with a research presumption that has no relevance at all to the context in which we understand the world which puts this research in danger of being too existential. Therefore acknowledging the impact of science allows me to challenge it thoughtfully. If we start with the nature of ideation and ideation tools, within a creative endeavour of design we are faced with how to understand it. Ideation and creativity have no solid representations in the world. They occur, we interpret them

but they may occur as a different type of matter and no manner in which to predict them. This issue is not resolved, but the world we live in is dictated by empirical methods of logic and reason where phenomena are acknowledged but not necessarily addressed or revealed to expose the short comings of science. The challenge of phenomena and creativity is relevant to Quantum theory and Chaos theory. Quantum theory provides tools to acknowledge behaviours like ideation or molecular behaviour that defy predictive or probabilistic assumptions. Remember pragmatism is a principle of method for estimating the practical value and results of philosophical conceptions (Heath 1904). I extend philosophical conceptions to ideation, based on the relationship between design and creativity. So now that we can acknowledge that there are phenomena and that things do not always behave the way we think they do, it can be elaborated on by using Chaos theory. This is an old theory which basically means that there are things that cannot be predicted. Chaos theory has been described labeled and observed. In the field of mathematics and modelling strange attractors, fractals and phase space occur. While applying them in the form of design itself is not novel, it is my observation that these concepts cannot encompass with any great consensus what is happening when creativity and ideation cannot be defined or observed. It seems like a pointless venture but the magic is in the proposition and to work out why it doesn't work. As Feynman and Weinberg state, there may not be a final underlying theory of physics, but better questions can be formulated about ideation (Feynman and Weinberg 1987). For this research the question also related to how ideation is treated as a strategic exercise when the act of ideation as a creative, novel and cognitive activity clearly is not.

Relationships between ideation or mental phenomena, design and science have gained traction within design and scientific research within the last 10 years. Scientific knowledge is prioritized within almost every aspect of our life, validated or no, I thought, at the time, the culturally significant scientific approach would be more acceptable to a client. There were plenty of tools that related science to design and ideation but this lead to significant methodological challenge at the onset. It included the perspective that a design process could be represented metaphorically by math by relating it to a system progressing from simple to chaotic behaviour. Within this system the initial conditions played a crucial role in the outcome. I related ideation to a design process's initial conditions. This was verified in the abstract and the literature review in terms of ideation being a significant condition critically affecting the outcome of the design process. A simple system exhibiting chaotic behaviour, had been observed in the study of linear and non linear systems going through a fractal (dimensional) transition (Bird 2003). Fractals for this research are defined by the characteristics of self-similarity and infinite length within a finite space. As it relates to the design process, I drew a comparison between the infinite amount of ideas generated during a finite albeit iterative ideation phase and fractals. Meadows described strange attractors, a characteristic of chaotic systems, that have fractal qualities as leveraging points in the system to affect the system outcomes (Boli 2004; Meadows 1999). I used this metaphor to transform the research into an intervention tool that could measure the chaotic characteristics of design problems for the designer. The intervention would be a probabilistic mapping tool so that the designer would have a way of talking to the client about what the perceived design problem was as it was presented by the design brief and what the actual

chaotic behaviour was, possibly eluding to a more complex problem. A Lyapunov exponent (LE) would be used to measure the chaotic level of the design problem by mapping the initial conditions of the design process as the are understood. If the LE is positive, tiny changes in initial conditions are magnified on average along the trajectory. A negative LE indicates that the trajectories differing by tiny changes in initial conditions tend on average to converge; such is the case with a stable point equilibrium or a stable periodic cycle. A stable invariant loop has an LE of zero; on average along a trajectory tiny changes in initial conditions are neither magnified or diminished (Dennis et al. May 2001, pp. 281). There are many initial conditions of an ideation process not only in design terms, but also in terms of the participants and the problem itself. I believe it is impossible to map all the initial conditions or to categorically or objectively prioritize them. The reason for this is that we do not know the origins or all the factors that brought about the problem, what factors are intentionally omitted as a consequence of the design brief and the awareness of the designer and clients regarding any ideas or factors outside of their awareness. I believe dimensional reduction could be an improvement on this process so that it forces the client and designer to consider contexts beyond the design brief. There had been much published regarding the use of fractals in chaotic and complex systems in addition to measuring chaotic behaviour with a Lyapunov exponent. Further research into chaotic systems revealed problems reconciling classical chaos and quantum chaos at least in mathematical terms (Belot and Earman 1997; Barry 1987; Constagnino and Olimpia 2006). It also draws focus for this research as it relates to reconciling classical physics and the occurrence of common unexplained phenomena (Kouptsov and Tomsovic 2004; Peat 2007). Unfortunately, as theories they are not suitable tools for this research regarding how physical or tangible interventions can be designed to measure chaotic behaviour during the ideation phase. Ultimately, using science to provide credible leverage for the designer by clarifying creative and chaotic phenomena did not work well as an intervention because a clear relation between theories and unpredictable behaviour has not been completed and by definition could not be in toto if in fact it is creative, novel, chaotic or complex. Bird, Demko et al., Gleick and Hwarng et al. to name a few have related fractals, chaos theory and strange attractors to daily phenomena including ideation. Batty commented on this difficulty given the amount of information needed to develop proper models (Batty 2005). Bird on the other hand has looked at the relationship between fractal, chaos theory and iterative process as a critical method of understanding mental processes. I see both sides and each has significant potential drawbacks but each also contributions by making critical cross disciplinary relationships. Using fractals or chaos theory, in either case, to relate to ideation can inadvertently set up a scenario where you find what you are looking for. Badiou described the inherent issues of translating meaning and reconciling concrete relationships (i.e. Russell's paradox) as a result of thought which ideation certainly shares as it is translated, negotiated and iterated into a physical design. In my opinion, attempting to model chaotic systems that are by definition unpredictable is untenable. I believe any approach reveals and is at times subservient to the design intention which is why unless the whole process (economic, ideation, design, measurement etc.) of our understanding can move from Cartesian approach beyond a Quantum theory perspective to better explain our world as it is ideation as an area of study may be stifled. This is why I would like to integrate dimension reduction and a quantum approach to

ideation after the PhD program. Ultimately, this method of approaching ideation was useful in providing a foundation of comparison between phenomenology and scientific limitations. Based on the difficulty of reconciling the meaning of ideation and validating the relationships I made between the design process and mathematical models, I chose to engage design activities within the context of the design process.

Based on the mathematically philosophical approach I needed a different kind of perspective for the ideation research regarding complex design problems and ideation. I chose one that was based on my design practice but within the context of where I was in the research process, I chose to return to practice to better clarify solutions to complex design problems. The methodologies used between design ideation, complexity and ideation tools are relatively new therefore my methods take what is available in each field to combine them as an approach. With this in mind this research has a much stronger element of rhetoric because it is not only providing a new tool but more significantly an argument regarding why it is necessary. I agree with Buchanan who makes a point regarding a central theme of design studies which applies to the methodology of design research. There is a rhetorical aspect that affects ideation in particular. As Buchanan states 'these studies involve a significant rhetorical component when they are concerned with the process of conceiving designs; the influence of a designer's personal attitude, values or design philosophy; or the way the social world of design organization, management, and corporate policy shapes a design (Buchanan 1985, pp. 4). Rhetoric is important to mention because my design approach differs from the conventional method. Ideation research is predominately conducted as either cognitive research, practice-led research or incremental research for enhancing design, engineering and product design processes. This means that approaches that fall outside or include all these steps while complex are under researched. While each specializes in an aspect of ideation and ideation tool design, they do not appear to purposely or actively take the complexity of design ideation into consideration. If this were not the case then the design process would have more transparency regarding the client led design process. There is little written about a possible assumption that the client via the design brief has aligned themselves with the complexity of the design task but paradoxically they cannot foresee an outcome if the nature of the problem can only be understood when it is engaged.

The second methodological level was the overall format of the thesis that follows a chronological timeline by breaking the research into parts/chapters instead of breaking into sections arbitrarily. It was counter productive to conform the reseach strictly to an academic writing formula that could distort the research. I explored a Socratic argument as a way of changing the tone of the thesis to an open method of enquiry since complexity and creativity need a dynamic and consistent method of engagement. I wanted to avoid writing or researching in a way that is no longer useful after new knowledge is found. Unfortunately, the Socratic method was not compatible with the PhD because the PhD in my experience was about defining one question and providing one answer that contributes to new knowledge. The Socratic argument in contrast is a method of pursuing knowledge and self awareness through questioning. A Socratic methodology and format of the writing would not be consistent with these aims because a method of questioning is different from a finite approach even if the new knowledge that evolved during the research included many critical divergent strands. The research process,

in my opinion, is still a closed process that culminates in a viva, not an infinite or ongoing method of thinking or questioning. I adopted the Analytical index by Paul Feyerabend in *Against Method* because answering why the research was being conducted and the difficulty became integral to the research. The format of the thesis reflects an intentional refrain from interpreting the actual ideation through the categorization of characteristics being that the nature of ideation is unresolved. The Analytical Argument provides steps of evaluation that builds a proof and possible answer. The following is an outline of the research with notes regarding the methods used in each section.

Three-body approach

I coined the phrase three-body approach from Poincare who is credited with describing the first 'chaotic' system, known as the 'restricted three body problem' as the non-conventional methodological approach. The reason I have coined this phrase is that Poincare made it clear 'in such chaotic systems, there were infinitely many trajectories, each with long term behaviour that was quite different from the others' (Kennedy et al. 2001, pp. 411). Poincare's description was relevant to this research in describing the role of design within the world, ideation within the design process and the potential roles the literature review, design activities, focused interviews and ideation tool might have in this research. I sought to combine them to support each other and provide a better picture of ideation. Although they cannot be coordinated to develop probable design outcomes they can provide a clearer picture than each aspect in isolation does on its own. The methodological components of the research are broken down into practice-led research with Moixa Energy, focused interviews with Symbian and the design activities.The first component of the literature review including on going information gather has been explained. I have reviewed ethnographic, self-reflexive, qualitative and interviewing methods in order to address the unique characteristics of the design projects and the resulting voice recordings.

Voice recorded ideation during design activity sessions

The voice-recorded design related conversations provide examples of dialog conflicts, resolutions, individual illuminations and shared illuminations when the client and I both arrive at a different idea or shared idea simultaneously. The voice recordings were made with the client's consent and knowledge that the conversations were contributing to academic ideation research. The location, company, design projects and people all varied but my dual role as designer and research student was consistent in each case. The design situations varied and at times included more than one decision maker, but the recorded conversations were predominately one to one. The recordings were limited to an ideation phase, before a concept was formalized and taken further into development or production and transcribed independently by UK Transcription in Brighton. The tasks varied between graphic design (print, web and media related) to market research.

The voice recordings benefit from not being contextualized. Ball and Ormerod have highlighted the importance of design within a context and by de-contextualizing it we fall back to more traditional (medical for example) mode of analyzing variable such as human skills, experience levels or the type of problem (Ball and Ormerod 2000, pp. 148). Ball and Ormerod cite Holman, Feltovich and Ford (1997) in their advances in showing constraints and opportunities arising from contextual and social factors and their important determinants of the

exercise of expertise as are tasks and skill-specific variables. The basic skills and responsibilities of the participants are included so that their knowledge is contextualized relevantly.

The voice recordings with Symbian, Moixa and exit interviews during the design activity serve as interviews. This benefits the research because as Brenner states, they are flexible and can accommodate scale (large or small number of informants), scope (general or focussed content areas), time (long or short interviews-retrospective, contemporary anticipatory information), interpretive schemes (univariate, multivariate statistical procedures/content analysis) and format (open and closed questions) (Brenner et al. 1985, pp. 5). Being that the voice recordings were not organized or developed with a high level of preplanning there were a number of ways the voice recordings can be interpreted. They were interpreted socially and culturally centred like understanding cultural boundaries between the client and the designer and how that affects the generation of ideas where ethnographic study may not have been appropriate. Bucciarelli describes design as a typically a highly context-bound endeavour, situated, as it is, within commercial organizations whose practices, structures and social interactions shape both final design products and the processes by which those products are achieved (cf. Bucciarelli, 1988)' (Ball and Ormerod 2000, pp. 148). I did not separate the two and if the cultural aspect was the focus, a self-reflexive ethnographic approach would have applied being that self-reflexive ethnography is sometimes described as a matter of 'stepping back' from full engagement in cultural activity which is often said to be emblematic of the sociological attitude (Berger, 1963)' (Lynch 2000, pp. 30). Button describes ethnography as a method of going further than describing and codifying to what relevant people do in the workplace. Ethnography could have allowed the research to focus on how the designer and the client ideate and their interaction. In this case the dialog could be given greater consideration. Since ethnography needs careful planning especially in terms of questions, scope and aims, evaluating the voice recordings was best considered as a context-bound endeavour.

Practice-led design

The experience of the design projects could be understood as a 'practice-led research' (Pedgley 2007). Practice-led research is an opportunity for deciphering the information, incorporating a new methodology, substantial reflection, analysing and theorising one's own design activity and design outcomes' (Frayling, 1997; Friedman, 1997; Cross, 1998; in press from Pedgley 2007, pp. 464). I describe the practice-led design projects (as represented by the voice recordings) as 'interfaces'. This will provide some clarity as to the role the voice recordings have within the research without restricting their content. Herbert Simon uses the term 'interface' in today's terms between an 'inner' environment, the substance and organization of the artefact itself, and an 'outer' environment, the surroundings in which it operates. If the inner environment is appropriate to the outer environment, or vice versa, the artefact will serve its intended purpose' (Simon 1996, pp. 6). Within this research the 'artefact' is the voice recordings. The 'inner' environment illustrates unique moments during the design process and how they reveal ideation and illuminations. The 'outer' environment is the research that is concerned with how more design possibilities can be generated. The function of the 'artefact' or design projects within the research is met if the 'inner' environment of the occurrence of ideations and the 'outer' environment

of the greater research are appropriate to each other. Suchman for example proposed that since design tools reify underlying models of the activity they are designed to support, developing an underlying conception is a crucial part of design (Suchman, 1987). Suchman was addressing cultural-historical activity theory or CHAT as opposed to better trained ethnographers to provide design insight during research and she recognized that in order for designs to be "realistic", designers must find ways of understanding work in practice (Suchman 1995) (Macaulay et al. 2000, pp. 37). Employing CHAT to evaluate this section of the research was difficult since it had been stated that the cultural and social relationships are not at the centre of the research.

Hermeneutic analysis of the interview transcripts could have provided information based on historical, grammatical, logical and transcendental points of view (Kemp-Pritchard 1981, pp. 75-77). Hermeneutics derives from the Greek verb hermeneuein. That verb is related to the noun of hermeneus, which is referable to the name of the god Hermes by a playful thinking that is more compelling than the rigour of science. Heidegger stresses this original sense of hermeneutics because it "brings out the Being of beings 'and not' in the manner of metaphysics, but such that Being itself will shine out" (p. 30). He goes on to affirm that it is "language [that] defines the hermeneutic relation," calling man himself to essential being' (Rosenfeld pp. 537). Percy has written in 'Phenomenological Research' (Percy 1956) that is capable of grounding phenomena like ideation. Di Bernardo (Di Bernardo 1984) has provided additional tools within a hermeneutic approach by understanding the text within a set of criteria. The criteria are two fold. The first criterion is to interpret the ideation "in the context" or not "of the context". The affects of context on ideation may be testable. Although hermeneutics allows the participant's information regarding their ideas and illuminations to be considered the participant's ideation experience will be used in comparison to the outcomes of the focused interviews.

Freud's 'dream-work' from *The Interpretation of Dreams*, provides four parameters for interpreting dreams that could be applied to the client's ideation (response). The work of Condensation, The work of Displacement, The means of representation in Dreams and Considerations of Representability. The Work of Displacement is another way of interpreting the role of an idea generation tool. What is clearly essential in the content of the dream-thoughts does not need to be represented in the dream itself at all. The dream, one might say, is centred differently; its content is ordered around the centre made up of elements other than dream thoughts.' (Freud 1961, pp. 232-233) If we take Freud's comment regarding the content of the dream-thoughts and apply it to idea generation, the state of creativity in which ideas are generated does not have to be within the context of the design. We are able to generate ideas outside the scope of the brief and allow ideas to flow even if their relevance is not apparent. All of these considerations fed into the perspective and assessment of the voice recordings and the protocol analysis video footage based on the aim of increasing design outcomes.

Protocol analysis of design activities

The last component is the protocol analysis of the controlled design activity. During the design activities the participants were given design briefs and at the end of the activity they were questioned regarding their experience and the number of ideas they generated were counted and compared. Cross provides a counter argument to decontextualised design scenarios, (Cross et al. 1996, pp. 13-14), but this position is substantiated

by Goldenberg (1999) Briggs and Reinig who claim that 'ideation techniques and technologies are often evaluated by counting the number of unique ideas generated by the ideating group [e.g., 15, 27]; treatments that produce a greater number of unique ideas are often deemed to be better than treatments that produce a smaller number of unique ideas' (Briggs and Reinig 2007). Goldenberg states that the notion that the rewards of generating a large number of ideas outweigh its costs can be traced back to early studies in the field (e.g., Marschak, Glennan, and Summers 1967) (Goldengberg 1999, pp. 200). The decontextualised nature of the test could be improved and given the constraints, it provided a better awareness of their experience as a critical consideration. As it was mentioned before the type of methodology employed within other research depended on the context of the tool and the area of study. Engineering design for example tends to employ more scientific approaches of making and modifying ideation tool by using quantitative, efficiency and historically based ideation. They include methods such as probabilistic approaches for extracting design preference, quantitative analysis of group decisions, Bayesian analysis of decision making (Yang 2009), cognitive modelling (Jin and Chusilp 2006). I will not review architectural or design methods at length because they have been reviewed in *Designing a collaborative face-to-face ideation tool* section. Design methods like protocol analysis and linkography are dependent on methods for observing and interpreting or having the participant interpret their thoughts as they are acting, their actions as they are being watched and the researcher who is interpreting all of this through their own perspective. Associating a methodology to judge the results of the research is counter productive. The methods are only useful as they give a hint about the condition of contradictions within the field. Acknowledging them does not alleviate them nor does it bring higher levels of probability to the outcome.

Surveying for relevant information

There have been two surveys conducted. The first survey was used during the design activities in order to account for participant experience, education, occupation and prior knowledge of ideation. The other survey was an online survey (www.surveymonkey.com) sent to 200 people and agencies regarding their use and definitions of ideation. Although the results are not as robust as I would like meaning 1000+ responses is a much stronger response than 20+. The results none the less provided some direction and based on that outcome, a future survey would be conducted by making distinctions between non-designers, designers and the designer's clients. The distinction between their expectations, experiences and definitions of ideation are key to any future surveys.

Methodological summary

The value in the methods is the acknowledgement of the uncertainty in contrast to the assured nature of the type of research that is occurring that guarantees innovative design solutions. The context of the research is as important to how the ideation tool was developed in contrast to a planned approach because it is qualitative in nature as opposed to the more quantitative approaches found in engineering. The research had the outcome of changing the perspective from that of a strict approach to ideation testing which is not definitive to a progressive and inclusive study. Using different methods progressively were emphasized in a field where findings are contextually dependent. This research provided new knowledge through multiple approaches that out of

context would not help the reader to know beforehand.

Methodologically there are flaws with including myself as a participant. Although this was discussed in the section along with an ideal scenario of having an in vitro and in vivo testing scenario, the ideal scenarios were not possible. It should be noted that there are no perfect scenarios for an unobservable process such as ideation and that there, at some point, will be an interpretation of either what they say they are thinking, influence of the actual testing activity and the differences between actual reactions during design practice. Ultimately, the focus of future research would be to more closely associate an ideation tool with a larger cross section of corporate and individual surveys focused on ideation and ideation phase definitions, experiences and methods. I would also expand the aspect of participant experience, interactions with the tool, alternate tool designs and the number of ideas they deem to be creative as starting measure.

POSSIBLE TRAJECTORIES FOR FUTURE RESEARCH

I attended the 40th anniversary of the Design Research Society at the Open University in 2009. Paul Gough, Professor and Pro Vice Chancellor Research and Enterprise, University of the West of England, presented 'Light Touch, Deep Impact: Research Assessment Past, Present, and Future'. He emphasized the importance of impact of higher education research. While this research was situated within practice and literature reviews, the impact is hypothesized for future research trajectories and potential industry impact.

The pre-life of the research reflects my personal interest and professional experience of the area of study. This research approach began as a broad question that became more focused though practice during the research. This was pivotal in my ability to focus the research. The outcome of this approach is mixed. While having a clear understanding sooner in the research may have provided more rigour in my ability to compare ideation tools it may have inhibited insights regarding the context of how ideas are generated with the client. Ideation tool research revealed a large area of study to be conducted but that area is limited to the groups who are conducting the ideation and where there is collaboration there is an overall emphasis on technology to either augment or to guide the process. Neither of which effectively address complexity either because of the limited scope of the technology (i.e. economy or design based) or that they cannot adapt, recognize and change with the complex design problem. The post-life could have multiple post doc implications and areas of research including research for deploying EiDOS within a business and higher education environment, research of ideation tools and two specific ideation iterations, further research to assess when designers use ideation tools as a part of their design process and the effectiveness, the expanded role of the designer as a facilitator and the expanded role of ideation tools and suggestions for better measurement of the ideation phase using dynamic.

For use within teaching – to advise student designers on how to improve their ideation process and how to use alone or with their client is critical.

Research to assess when designers use ideation tools as a part of their design process and the effectiveness.

This research suggests that designers have habits of approaching design problems and these habits are not self evident. This can affect the introduction or implementation of ideation tools difficult for three reasons. The first is that the designer can allow the ideation tool to become a design process in itself by trying to generate ideas that fit the criteria (Ex: TRIZ), the ideation tool can be disregarded as it does not reinforce their process or the designer may not see value in it and the third reason is that the designer may negate the ideation tool altogether, relying on their own process and not recognizing their mental habits or when they actually need an ideation too. The last two examples hinge upon the designers understanding of the ideation tools purpose and how it can help them. These understandings are translated for example from the design studio culture and education.

Research within studios and higher education can tell us more about how designers use ideation tools and how they (all participants i.e. designers, teachers, supervisors) perceive their use. Protocol analysis is absolutely critical for observing as much as can be what is happening during the design activity. Protocol analysis as it relates to saying what they are thinking could be difficult as a reflection of this research where the participant Stephan conducted ideation primarily through drawing.

Deploying EiDOS within a business and higher education environment

EiDOS can be an effective for two clients, the designer within higher education and the designer within practice. They will have slightly different goals based on their environments. Based on the designer's inability to manage both the process and the design activity in both Groups A and B, learners as opposed to the seasoned designer had a more difficult experience balancing the design process with the augmentation of the ideation tools. There is also a clear problem regarding the two very distinct purposes of the ideation tools. While the designers in Groups A and B saw them as not only inhibiting, they also failed to see that their ideation had stalled, they used an idea generation exercise to formulate final designs. It can be easier to correct bad habits before they start and to give the designer an awareness of complex design problems and alternate approaches. There are two reasons for this. The first is that as Lauche stated, by corroborating Wallmeier et al. 1999 and Gunther 2001, there is evidence that good design can be taught (Lauche 2005, pp. 191). The second reason is evidenced by Tim Brown, CEO of IDEO who stated that the role of the designer has changed from tactical to strategic. We are now involved in the beginning of the process and leads to dramatic new forms of value (Brown 2008).While technology has been implemented as a method of ideation, the integration of technology can easily decontextualize ideation into a simplified creative process to problem solve, replicate and predict, when ideation as a phenomena or creative activity like graphic design[24] where valued based on unpredictability and irreducibility (Gurwitsch 1949). This however does not impede the deployment of EiDOS through technologically allowing designers to communicate across the world.

Novice and experienced designers face challenges from industry regarding not only their approach but their experience, therefore it also suggested that EiDOS be deployed to the seasoned design practitioner through facilitation. The goal for deploying EiDOS within a higher academic environment is that it could facilitate a level of engagement with their peers giving them experience in approaching complex design problems, incorporate empathy for their clients through a focus on inter design communication, balancing design context and through this providing the field of cognition valuable information regarding the role of the teacher in understanding and facilitating how designer conduct ideation and area that is still quite weak (Bruner 2006). This approach faces pressures within education like adverse creative teaching methods like having learners 'jump through hoops' (McClaren and Stables 2007 pp. 2) and validating creative curriculums that are aligned with business. Higher Ambitions is a booklet outlining education as strategic advantage and also as a source of

revenue in higher education institutions and it was developed by the Department of Business Innovations and Skills. Although the relevance of education can be found within this handbook such as 'they will bring together universities, employers, HEFCE and the UK Commission for Employment and Skills (UKCES) to identify and tackle specific areas where university supply is not meeting demand for key skills, and will expect all universities to describe how they enhance students' employability' (Department for Business, Innovation & Skills, 2009). This focus and strategic move by government makes critical the need to offset transitions of design being a creative solution finding activity into a design that is even more so concerned and dictated to validate itself through employability and economics of design. These approaches have been reviewed and ironically are detrimental to the creative process of providing solutions for complex design problems. It can however, function as a scaffold in a Zone of Proximal Development (ZPD). 'The discrepancy between a child's actual mental age and the level he reaches in solving problems with assistance indicates the zone of his proximal development;' (Vygotsky 1986, pp. 187). For this research the ZPD is complex design problems and EiDOS is the scaffolding or the tool that students can use between them to generate solutions.

A secondary deployment for designers within practice is useful, regardless of experience. Matook and Indulska have suggested a quality function deployment based method, but it like many other methods are measured based on improvements that are realized through the increase in organization wealth. This type of facilitation can only work if the goal is to improve creativity and communication. This creates a bit of paradox given 'innovations reflect a critical way in which organizations respond to either technological or market challenges (Brenner 1987, Gomes-Casseres 1994, 1996, Smith et al 1992, Hage 1988)' (Hage 1999, pp. 599). In light of that, I am suggesting that we allow the process to lead the company instead of the other way around. We need a better understanding of the relationship between the client and the designer, more can be done to improve communication. For this to be effective I am suggesting that a facilitator be trained using EiDOS instead of the designer be held with the task of guiding the ideation phase.

One of the outcomes was the identification of two types of iterations. The iterations are defined within this research as possibilities and pragmatic iterations. The iterations of possibilities result through conversations and the use of ideation tools between two people (either client and designer) where the familiar territory meets the ideation tool and the ideation tool catalyses the conversation and it goes into a different direction. The ideation tool provides less focuses but enough of a relation that they are able to make a jump to a new space. Although the goal is not to litter the ideation landscape with new jargon, but there are significant differences in the theory of the mind and cognition of designers vs. clients (or the rest of us) so that the approaches thus far have been kept within the design studio. Jin and Chusilp conducted research on mental iterations in engineers. They have defined ‘iteration loops’ and have found more ‘iteration loops’ predominately in ‘creative’ design than ‘routine’ design scenarios. They have also stated that with constrained problems less iteration loops were observed (Jin and Chusilp 2006, pp. 25). Jin and Chusilp identified the steps: analyse problem, generate, compose and evaluate as four key cognitive processes during ideation generation. They are composed in an algorithmic

fashion with linearity going from design knowledge through generate idea, compose, evaluate to complete concept (Jin and Chusilp 2006, pp. 30).Their method is informative, but their research does not extend into designer and non designer interactions (i.e. client and designer) and while the tool is meant to generate more ideas, this research supports that even though more ideas can be generated through methods like TRIZ, it does not improve the quality or experience of the design activity for the designer or client. If in fact there is a 'designerly way of knowing', then this process is exclusive in that capacity. These findings could lead to a different area of research to understand if there are different ways for approaching complex design problems and what kind of iterations occur or if the designer and client experience them differently.

Design iteration can be recognized in different forms, ranging from simple task repetition to heuristic reasoning processes (Costa and Sobek 2003). Based on what is repeating, one can classify iteration into two primary types: iteration of design tasks and iteration of cognitive activities. For the first type, iteration is recognized as repeating design tasks in a design project, which is often carried out by a team of designers. For the second type, iteration is recognized as repeating cognitive activities in a single designer's mind when he/she is performing design tasks.(Jin and Chusilp 2005 pp. 25)
There are significant questions regarding how the designer knows they are ideating and when in fact they should use a tool to break mental habits as this research has clarified an issue where they may be frustrated by the design brief but the design activity of generating ideas using a tools should be less so, but the iterative process of formulating a design solution calls into question the designers ability to differentiate between ideation (generation of ideas) and the design process of producing something.

For developing the role of the facilitator in helping the designer and client during ideation.

EiDOS would benefit the business context if it were implemented by a facilitator instead of by the designer. This may not be the case if this was occurring within the studio, but as it involves both the designer and the client they need to have their full attention on the task of orientating themselves and also generating ideas. Going through the steps albeit easier than going though the steps of TRIZ in comparison is easier, they can still overlook issues. This is especially true for novice designers who will not manage the ideation phase well, who will look for specifics in the brief or to struggle with the nature of the design process as it's given instead of the design process as a whole which includes the client. With older designers, they will have experience with the design process and may be able to balance the role of designer and facilitator at the same time, but they will have to know beforehand what is expected of them and why. They while being more prone to mental habits would benefit from some run throughs so that they can experience something new and understand why it is important to be there.

Humphreys and Weakley concluded in their interaction research that the role of facilitator as an internal expert to an organization can have an 'educative' as a representative of the user group. They can be better positioned to prepare and persuade users to adopt an application than someone external to the organisation (Humphreys and

Weakley 2008, pp. 620). As a consultant who is external to the organisation, the facilitator role for cognitive ideation tools has been suggested within engineering design by Karni and Arciszewski. They have stated that 'the design tool should act more as an observer, or suggester, rather than a controller or an expert' (Karni and Arciszewski 1997, pp. 146). This is precisely the role within design that a facilitator, but it is important that each designer is able to take this role as a matter of improving their own practice as opposed to relying on a facilitator. Also where Karnie and Arciszewski state that the suggestion are alternatives, the facilitator is not there to change the creative trajectory but to guide the process with the client and the designer in recording ideas and spotting the client and the designer witin the frame work of the ideation tool to ensure they don't just stop which is differentiated from reflection or long pauses.

For considering comfort and experience in the design of ideation tools.

Exploring the possible future trajectories of EiDOS

The role of EiDOS could be redefined as a tool to guide or a set of multiple tools to engage the design process to better create and maintain an environment in which ideas visual, audio and phenomenological can be formulated and shared alongside other ideation tools such as Human Centred TRIZ ideation tools that have been designed for the user experience in the design studio with clients and also within academia.

The role of EiDOS could assist the client or designer in identifying a working compatibility. If either participant is not willing to either engage each other or take a different direction, then based on the application of EiDOS at the beginning of the design process, money and time can be saved. EiDOS then takes a filtering role.

For investigating alternative ideation research techniques that describe the complexity of the design activity.

Continued research of design ideation iterations within in vivo and en vitro

This research had limited resources and time therefore more attention could not be allotted for practice and control setting ideation design activities. Based on the amount of resources generated within the 12 sessions, it is just the beginning. More effective methods can be used and optimized to ask more or less specific questions regarding ideation and considering the size of the field of what is unknown and the impact within design this area of research is disproportionately under researched.

For assisting in the further development of intuitive methods for co-generating ideas between designers and clients in complex design scenarios.

Developing more effective methods of contextualizing ideation research by using dimensional reduction and

Shannon's Entropy.

What I mean by this is to say that we live in a very technocratic and scientific world. We utilize a classical approach to most problems. We build on probabilities and increasing expectations that if we know enough about a problem we can not only solve it but predict it's onset. This occurs within weather prediction, gene therapy and war. Where it occurs in design is exemplified by Owens who uses hierarchy to evaluate complex systems. I disagree with this method based on the definition of complex system. It's a stationary model and worse by using hierarchy an arbitrary order is generated where the dependencies are not well understood (Owen 2007). What we also know is by definition complex situations cannot be predicted. We know this because of chaos theory and quantum mechanics. Quantum mechanics gives us insight into the very small world where our predictions do not work. Things happen and they happen contrary to what should happen. There are two points I would like to make and the first and most obvious point is that we cannot predict what our lover, mate, friends, weather, football team, smoke, the biosphere that is Earth will do. Life as Lyall Watson states is 'a rare and unreasonable thing' (Watson 1973). Over time we have observed and developed probabilities, so if we hit our friend they may hit us back, unless your friends are different than mine and even then this is an act of probability. What we tend to learn most comes from the most improbable events because they convey more information (Watson 1973). This method of building on our experience to inform current and future decisions is a good idea, but it is also precarious when things change, people divorce, we have cold snaps, Arsenal goes from first to 4th in the Barclays cup. Within our economic, scientifically and technologically dependent cultures we pride ourselves on the ability to build information so that our choices have expected results. War from my personal experience is still an area in which we try to formulate quick fixes. In reference to the first and second Gulf war of my generation the government tries and tries but as history continues to teach us that nothing is certain. Design issues, war, production, interaction and economics all have some dependency but we are still in an approach that if we do this then that will occur and not only occur but it is so simple that the relationship is one to one, which in our society this is now the phenomena of the past. If we believe this then we also for a moment hypothesize a different way of looking at the world. Our world is complex and I cannot derive enough information through a classical or one to one approach. So what do we do now. I suggest as a first step we acknowledge as a working premise that we operate in a quantum space. By this I mean quantum or as Feynman says a 'peculiar aspect of nature that goes against common sense' and space is like saying we have been looking at problems two dimensionally and we realize actually there are a few other dimensions so now we no longer have a point or a line but we have a plane and time as a factor.

The interaction between a complexity found in certain design problems and the ambiguity in verifying either ideation or the effects of ideation tools on ideation and a growing understanding that the ideation space is best described within as a quantum state, can benefit from expanding the area and application of research. All ideation research is a navigation of components (i.e. cognitive, phenomenological, biological, and environmental) including this one. The components are what allow us to research ideation, an activity we access

but cannot easily or consistently replicate, explain or model. We must make assumptions within ideation research that these components do something and more importantly that they impact the process in the same way we think it does.

The critical nature of the ideation phase is accepted as significantly impacting the rest of the design process and it's helpful to understand this in more than economic terms (Dorta and Perez). The ideation phase when seen as part of the design process model is similar in context to Batty's scientific reference. Batty describes models like design that are sensitive to their initial conditions. The ideation phase would be an initial condition of the design process. Initial conditions are normally discussed in relation to how small shifts in models or systems can over time produce huge differences. Research into the susceptible systems and the impact of initial conditions confirms the importance of ideation tho the ideation phase and in short, ideation's significant impact on the rest of the design process (Bird 2003, Stewart 1997 and Kellert 1993). While ideation could be considered an initial condition, ideation produces decisions that can predetermine the final result of the thinking process (de Bono 1971, pp. 6). There is only an association between ideation tools that help generate ideas and their subsequent impact on the design process. I mainly refer to the actual ideation tool and its impact on the cognitive function of generating ideas.

The complex[xlix] ideation space in which the set of all ideas is infinite and given the equally infinite causal possibilities, graphic dimensional reduction methods[l] could be useful for weighing time sensitive probabilities of causes so that any further measurements like Shannon's entropy is more validate and not assumed (Martin, 2006[li]; Yin and Cook, 2002; Fodor, 2002; Gero and Kan, 2008). Dimensional reduction and Shannon's Entropy are one trajectory for future research that could provide significant insights and possibly more general approach that can be applied to more ideation research that is currently possible based on the specialized context in which each ideation research operate. Ideation research as it relates to ideation tools provides analysis partially based on assumptions made that define relationships between ideation and definable values (i.e. components, currency, definitions) such as the links in linkography (Goldschmidt), design knowledge transmutations (Karni and Arciszewski), PROMETHEE and AHP (Macharis et al.), crossed array design (Montgomery) or iteration loops (Jin and Chusilp). Iterations loops for example is part of a larger model that implies at least in an operational form, prediction which can be verified by physical tests. The application of these physical tests on a phenomenological activity is difficult unless the parameters are such that most information is ignored and that the remaining design meets the criteria that was set forth.

Creativity and ideation are subjective, ill defined and not quantitative without an arbitrary judgement which contributes to the fractions that exist in ideation research. I suggest dimensional reduction based on the complexity of the activity and the actual variables involved. Dimensional reduction is helpful because it fist sets up a large amount of data; then within that data is another set built on some criterion. It can be seen as an outcome of EiDOS where many possibilities are generated into a data set, under different conditions. This is an attempt to move ideation into a more descriptive state than what is afforded through individual observations

and components can account for i.e. the dimension or number of variables that are measured on each observation increases but rarely contributes to a picture of ideation (Fodor 2002).

Ideation tools, as a direct or indirect product of cognitive, design and ideation research, assist in the generation of creative ideas (Karni and Arciszewski 1997; Montgomery 1999;). An emphasis by academia and industry is placed on developing ideation tools within their own environments specifically for and within design segments like industrial, architecture, engineering, product development and operational methods (Mohrfeld 1974; Kokotovich 2007). The impact of the research and EiDOS are hard to measure at this stage since the exposure to academia and business has yet to be made in real terms. There is a critical need and therefore great potential for positively impacting business and education. There is an obvious need for more trials which will show EiDOS is needed. More trials will confirm the value in both academia and industry and prove itself as an invaluable tool for design.

FAMOUS LAST WORDS

'Conceptual awareness occurs when the process breaks down.' - Heidegger

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APPENDIX

Design activity details

EiDOS Group A (Stephan and Faith)

	Date	Total Ideas	Average ideas per minute	Total time of test	Total Post-its	Role
EiDOS	17/11/09	58	0.52	01:55:17	18	
Stephan		38	0.33		11	Designer
Faith		20	0.17		7	Client

Sig
The green box indicates when the design brief were finished.

Sig
The blue box indicates when they finished sharing and began reading the brief

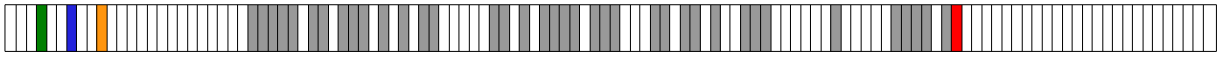
Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Faith

Stephan



TRIZ Group A (Stephan and Faith)

	Date	Total Ideas	Average ideas per minute	Total time of test	Total post-its	Role
TRIZ	04/12/09	93	1.01	01:31:53	37	
Stephan		46	0.5		30	Designer
Faith		47	0.51		7	Client

Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing on post-its and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Stephan

Faith

Placebo testing Group A

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
Placebo	07/12/09	38	0.77	49:49:46	15	
Stephan		24	0.48		12	Designer
Faith		14	0.28		3	Client

Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Stephan

Faith

EiDOS Group B (Stephan and Marian)

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
EiDOS	26/11/09	12	0.1	Approx. 1:55:00	12	
Stephan		4	0	00:49:03	4	Client
Marian		8	0.06	00:49:03	8	Designer

Sig
The blue box indicates when they finished sharing and began reading the brief

Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Stephan (at this point, the video battery died)

Marian

TRIZ testing Group B

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Familiar pairing	Role
TRIZ	07/12/09	70	0.72	01:37:26	28		
Stephan		42	0.43		18		Designer
Marian		28	0.28		10		Client

Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Stephan

Marian

Placebo testing Group B

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
Placebo	09/12/09	40	0.21	01:23:23	13	
Stephan		17	0.2		8	Designer
Marian		23	0.28		5	Client

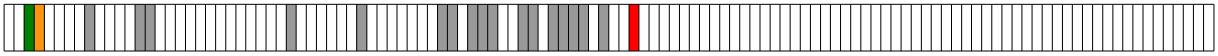
Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

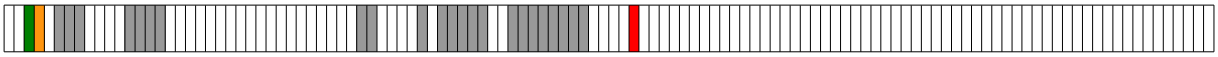
Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Stephan



Marian



TRIZ Group C (Kevin and Nikos)

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
TRIZ	12/12/09	12		00:30:30	8	
Kevin		11	0.33		7	Designer
Nikos		1	0.03		1	Client

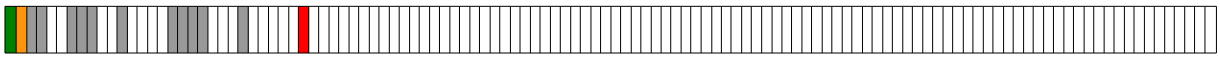
Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

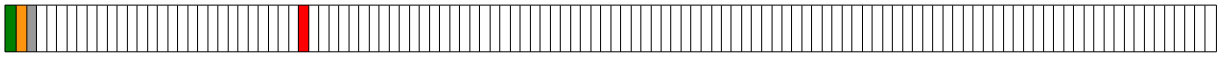
Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Kevin



Nikos



EiDOS testing Group C

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
EiDOS	12/12/09	20		00:33:20	6	
Kevin		17	0.51		5	Designer
Nikos		3	0.09		1	Client

Sig
The green box indicates when the design brief were finished.

Sig
The blue box indicates when they finished sharing and began reading the brief

Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Kevin

Nikos

Video notes

The idea generation, was mostly collaborative where I was writing ideas down as we came up with them.

Placebo Group C (Kevin and Nikos)

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
Placebo	12/12/09	9		00:13:07	7	
Kevin		6	0.45		5	Designer
Nikos		3	0.22		2	Client

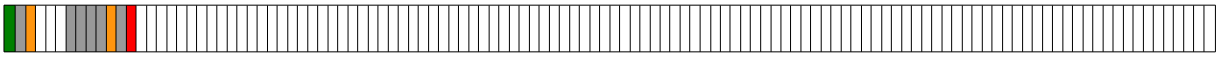
Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

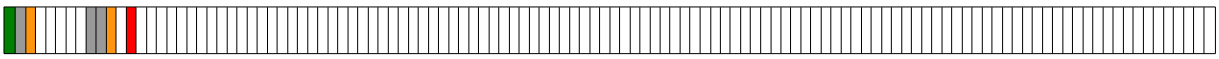
Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Kevin



Nikos



PHASE II TESTING

EiDOS testing Group D

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Familiar pairing	Role
EiDOS	17/12/09	27		00:47:55	17	no	
Kevin		16	0.34		11		Designer
Giorgio		11	0.23		6		Client

Sig
The green box indicates when the design brief were finished.

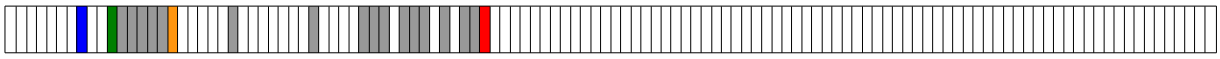
Sig
The blue box indicates when they finished sharing and began reading the brief

Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Kevin



Giorgio

s

Group results

	Ideation tools	Total Post-its	Creativity (participant rating 1-10) average	Exploration of ideas (participant rating 1-10)	Score (Creativity * Communication* Exploration* post its)
	EiDOS				
Group A		18	10	9	1620
Group B		12	10	6	720
	TRIZ				
Group A		37	4.5	4.5	749.25
Group B		28	3	4.25	357
	Placebo				
Group A		8	9.5	8.5	646
Group B		13	5.5	5.5	393.25

TRIZ Group D (Kevin and Giorgio)

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
TRIZ	17/12/09	12		00:28:38	12	
Kevin		9	0.21		7	Designer
Giorgio		3	0.1		5	Client

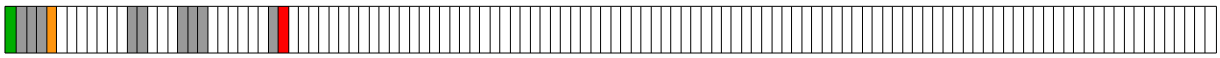
Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

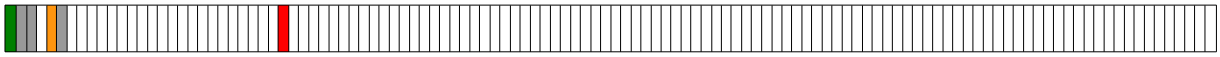
Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Kevin



Giorgio



Placebo Group D (Kevin and Giorgio)

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
Placebo	17/12/09	7		Approx 00:10:00	19	
Kevin		5	0.5		11	Designer
Giorgio		2	0.2		8	Client

Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Kevin (video ended at 00:07:37)

Giorgio

Group Results

Groups	**Ideation tools**	**Total Post-its**	**Creativity (participant rating 1-10) average**	**Exploration of ideas (participant rating 1-10)**	**Score (Creativity * Communication* Exploration* post its)**
	EiDOS				
Group C		6	10	9	540
Group D		17	7.5	5.5	701.25
	TRIZ				
Group C		8	0	1.5	12
Group D		12	4	3.5	168
	Placebo				
Group C		7	9	6.5	409.5
Group D		19	6.5	6	741

EiDOS testing Group E

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Familiar pairing	Role
EiDOS	13/02/10			01:01:42	21	yes	
Janko		3	0.05		1		Designer
Kevin		30	0.49		20		Client

Sig
The green box indicates when the design brief were finished.

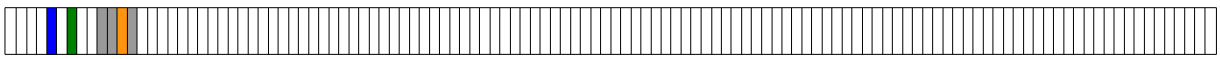
Sig
The blue box indicates when they finished sharing and began reading the brief

Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Janko



Kevin

TRIZ Group E (Janko and Kevin)

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
TRIZ	13/02/10	16		00:52:42	7	
Janko		6	0.12		2	Designer
Kevin		10	0.19		5	Client

Sig
The green box indicates when the design brief were finished.

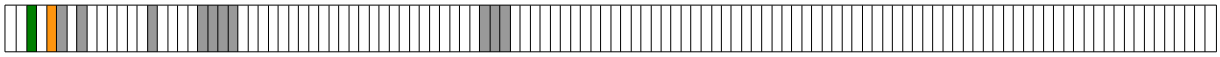
Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Janko

Kevin



Placebo Group E (Janko and Kevin)

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
Placebo	13/02/10	34		00:37:02	16	
Janko		16	0.43		4	Designer
Kevin		18	0.48		12	Client

Sig
The green box indicates when the design brief were finished.

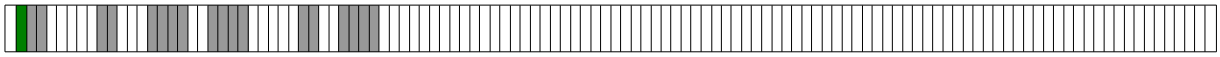
Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Janko

Kevin



TRIZ Group F (Urusla and Kevin)

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
TRIZ	17/02/10	25		01:05:15	18	
Uzsalia		12	0.18		2	Designer
Kevin		13	0.2		16	Client

Sig
The blue box indicates when they finished sharing and began reading the brief

Sig
The green box indicates when the design brief were finished.

Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Kevin

Uzsalia

Placebo Group F (Uzsalia and Kevin)

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Role
Placebo	17/02/10	8		00:18:33	8	
Kevin		6	0.3		7	Client
Uzsalia		2	0.1		1	Designer

Sig
The green box indicates when the design brief were finished.

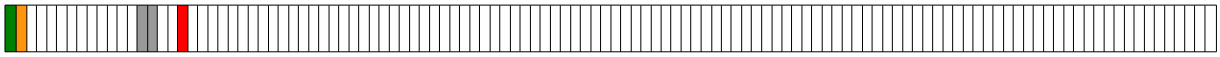
Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Kevin

Uzsalia



EiDOS testing Group F

	Date	Total Ideas	Ideas per minute	Total time of test	Total Post-its	Familiar pairing	Role
EiDOS	17/02/10	15		00:48:01	16	yes	
Kevin		14	0.29		14		Client
Uzsalia		1	0.02		1		Designer

Sig
The green box indicates when the design brief were finished.

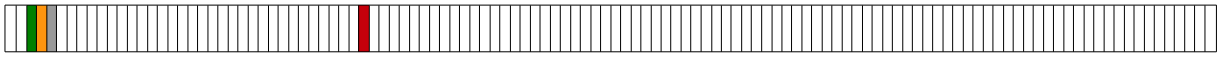
Sig
The orange box signifies when they started talking

Sig
The grey box is when they started writing and each time they were writing

Sig
The red box is when they stopped writing ideas and began with the evaluations

Kevin

Uzsalia



Group Results

Groups	**Ideation tools**	**Total Post-its**	**Creativity (participant rating 1-10) average**	**Exploration of ideas (participant rating 1-10)**	**Score (Creativity * Communication* Exploration* post its)**
	EiDOS				
Group E		21	10	10	2100
Group F		16	6	7.5	720
	TRIZ				
Group E		7	1	1	7
Group F		18	6	6.5	702
	Placebo				
Group E		16	4.5	7.5	540
Group F		8	5	6.5	260

Group A – F group results

Highest participant rated tool	Familiar pairing	Gender	Total post-its	Total time (est.)	Post-it contact	Post-it contact per minute	Notes
Group A (E)	no	f/m	18	01:55:17	58	0.5	
Group A (T)	no		37	01:31:53	93	1.01	
Group A (P)	no		15	01:49:46	38	0.77	
Group B (E)	no	f/m	12	01:55:00	n/a	n/a	video stopped
Group B (T)	no		28	01:37:26	28	0.72	
Group B (P)	no		13	01:23:23	40	0.21	
Group C (E)	yes	m/m	6	00:33:20	20	0.6	
Group C (T)	yes		12	00:30:30	8	0.36	
Group C (P)	yes		9	00:13:07	9	0.67	
Group D (E)	no	m/m	17	00:47:55	27	0.57	
Group D (T)	no		12	00:28:38	12	0.42	
Group D (P)	no		19	00:10:00	n/a	n/a	video stopped
Group E (E)	yes	m/m	21	01:01:24	33	0.54	
Group E (T)	yes		7	00:52:42	16	0.31	
Group E (P)	yes		16	00:37:02	34	0.91	
Group F (E)	yes	m/m	16	00:48:01	15	0.31	
Group F (T)	yes		18	01:05:15	25	0.38	
Group F (P)	yes		8	00:18:33	8	0.4	

Group A – F summary results

	Ideation tools	Total Post-its	Creativity (participant rating 1-10) average	Exploration of ideas (participant rating 1-10)	Score (Creativity * Communication* Exploration* post its)
	EiDOS				
Group A		18	10	9	1620
Group B		12	10	6	720
Group C		6	10	9	540
Group D		17	7.5	5.5	701.25
Group E		21	10	10	2100
Group F		16	6	7.5	720
	TRIZ				
Group A		37	4.5	4.5	749.25
Group B		28	3	4.25	357
Group C		8	0	1.5	12
Group D		12	4	3.5	168
Group E		7	1	1	7
Group F		18	6	6.5	702
	Placebo				
Group A		8	9.5	8.5	646
Group B		13	5.5	5.5	393.25
Group C		7	9	6.5	409.5
Group D		19	6.5	6	741
Group E		16	4.5	7.5	540
Group F		8	5	6.5	260

Cillier's 10 characteristics of complexity

i. Complex systems consist of a large number of elements. When the number is relatively small, the behaviour of the elements can often be given a formal description in conventional terms. However, when the number becomes sufficiently large, conventional means (e.g. a system of differential equations) not only become impractical, they also cease to assist in any understanding of the system.
ii. A large number of elements are necessary, but not sufficient. In order to constitute a complex system, the element have to interact, and this interaction must be dynamic. A complex system changes with time. The interactions do not have to be physical; they can also be thought of as the transference of information.
iii. The interaction is fairly rich, i.e. any element in the system influences, and is influenced by, quite a few other ones. The behaviour of the system however, is not determined by the exact amount of interactions associated with specific elements. If there are enough elements in the system (of which some are redundant), a number of sparsely connected elements can perform the same function as that of one richly connected element.
iv. The interactions themselves have a number of important characteristics. Firstly, the interactions are non-linear. A large system of linear elements can usually be collapsed into an equivalent system that is very much smaller. Non-linearity also guarantees that small causes can have large results, and vice versa. It is a precondition for complexity.
v. The interactions usually have a fairly short range, i.e. information is received primarily from the immediate neighbours. Long-range interaction is not impossible, but practical constraints force this consideration. This does not preclude wide-ranging influence – since the interaction is rich, the route from one element to any other can usually be covered in a few steps. As a result, the influence gets modulated along the way. It can be enhanced, suppressed or altered in a number of ways.
vi. There are loops in the interactions. The effect of any activity can feed back onto itself, sometimes directly, sometimes after a number of intervening stages. This feedback can be positive (enhancing, stimulating) or negative (detracting, inhibiting). Both kinds are necessary. The technical term for this aspect of complexity is recurrency.
vii. Complex systems are usually open systems, i.e. they interact with their environment. As a matter of fact, it is often difficult to define the border of a complex system. Instead of being a characteristic of the system itself, the scope of the system is usually determined by the purpose of the observer. This process is called framing. Closed systems are usually merely complicated.
viii. Complex systems operate under conditions far from equilibrium. There has to be a constant flow of energy to maintain the organization of the system and to ensure its survival. Equilibrium is another world for death.
ix. Complex systems have a history. Not only do they evolve through time, but their past is co-responsible for their present behaviour. Any analysis of a complex system that ignores the dimension of time is incomplete, or at most a synchronic snapshot of a diachronic process.
x. Each element in the system is ignorant of the behaviour of the system as a whole, it responds only to information that is available to it locally. This point is vitally important. If each element 'knew' what was happening to the system as a whole, all of the complexity would have to be present in that element. This would entail a physical impossibility in the same sense that a single element does not the necessary capacity, or constitute a metaphysical move in the sense that 'consciousness' of the whole, our focus shifts from the individual element in the system to the complex structure of the system. The complexity emerges as a result of the patters of interaction between the elements. (Cilliers, 1998 pp. 3-4)

Applying TRIZ steps to Moixa Energy

i. Segmentation - Divide an object into independent parts. (Ex: Replace mainframe computer by personal computers)
    1. Ideal example: The POS and the battery packaging could be given more environmental consideration.
    2. Moixa Energy example: During the ideation session, Chris had stated that changing the physical dimensions of the POS was not impossible, but unlikely as the factory in China had the specifications and changing them would be costly and would necessitate a large order for cost effectiveness[1].

ii. Taking out - Separate an interfering part or property from an object, or single out the only necessary part (or property) of an object. (Ex: Use the sound of a barking dog, without the dog, as a burglar alarm)
    1. An ideal example: The design process is an extension of the brand, the 'promise' between the client and their customer.
    2. Moixa Energy example: The application of the brand to the POS was interfering. A conflict arose between applying Duracell and Energizer's successful marketing over their brand.

iii. Local quality - Change an object's structure from uniform to non-uniform, change an external environment (or external influence) from uniform to non-uniform. (Ex: Lunch box with special compartments for hot and cold solid foods and for liquids)
    1. An ideal example: Physically changing the packaging of the POS or the battery would solve branding and market positioning issues.
    2. Moixa Energy example: They were open to some physical changes to the POS but they were limited based on pre-existing fabrication agreements that required large amounts to be produced to keep the cost low.

iv. Asymmetry - Change the shape of an object from symmetrical to asymmetrical. (Ex: Asymmetrical mixing vessels or asymmetrical vanes in symmetrical vessels improve mixing like cement trucks, cake mixers, blenders)
    1. Ideal example: Changing the shape of the packaging, POS or the battery would solve branding and market positioning issues.
    2. Moixa Energy: They were open to some physical changes to the POS but they were limited based on pre-existing fabrication agreements that required large amounts to be produced to keep the cost low.

v. Merging - Bring closer together (or merge) identical or similar objects, assemble identical or similar parts to perform parallel operations. (Ex: Personal computers in a network)
    1. Ideal example: Bringing identical or similar objects Energizer and Moixa to solve branding and market positioning issues.
    2. Moixa Energy example: Merging marketing approaches of competitors for similar results overlooked critical differences including short and long term goals and product/brand representation.

vi. Universality - Make a part or object perform multiple functions; eliminate the need for other parts. (Ex: Handle of a toothbrush contains toothpaste)
    1. Ideal example: The POS would effectively function as branding, marketing and revenue generator.
    2. Moixa Energy example: The POS functioned well for transport and display. The actual graphics were suggested to be changed not in line with the brand but kitsch marketing trends.

vii. The Nested doll - Place one object inside another; place each object, in turn, inside the other. (Ex: Measuring cups or spoons)
    1. Ideal example: Literally nesting the battery in the POS/marketing material or metaphorically as a method of embedding the brand in the marketing/POS material.
    2. Moixa Energy example: POS/battery package/battery were nested for transport and display. Discovering the brand apart from current marketing trends was at the centre of most conflicts.

1 (moixa_020707, pp. 30-31)

viii. Anti-weight - To compensate for the weight of an object, merge it with other objects that provide a lift. (Ex: Inject a foaming agent into a bundle of logs, to make it float better)
    1. Ideal example: Compensating for the weight would provide branding, marketing or revenue solutions.
    2. Moixa Energy example: Compensating for the weight of an object the POS/battery/battery package would not address the branding or marketing challenge.
ix. Preliminary anti-action - If it will be necessary to do an action with both harmful and useful effects, this action should be replaced with anti-actions to control harmful effects. (Ex: Pre-stress rebar before pouring concrete)
    1. Ideal example: An anti-action will provide added value and protection to the customer and provide added value.
    2. Moixa Energy example: Preliminary anti-action was discussed hypothetically relating to the environmental impact of USBCell. We agreed that the most environmental action could be that of not selling the product since USBCell may or may not take market share away from existing brand and increasing market share could over all increase the negative environmental impact.
x. Preliminary action - Perform, before it is needed, the required change of an object (either fully or partially). (Ex: Pre-pasted wall paper)
    1. Ideal example: From the client's perspective ideally, all the marketing material could be prefabricated so that little or no work was needed in order to produce relevant, impacting designs without hiring a designer.
    2. Moixa Energy example: Prefabricated marketing versions for the POS was requested in order to substitute key aesthetics and launch different POS versions quickly with minimal effort. Regarding the design process, preliminary action was discouraged as it related to Moixa Energy brand information but focused primarily on competitors.
xi. Beforehand cushioning - Prepare emergency means beforehand to compensate for the relatively low reliability of an object. (Ex: Back-up parachute)
    1. Ideal example: Beforehand cushioning would ensure a successful product. For the client this was ensured by looking at what had been successful including their competitors.
    2. Moixa Energy example: Beforehand cushioning was discouraged by Moixa Energy who viewed the design brief/project as a design in action and production a priority. As it relates to either follow up marketing or testing to validate the need for cushioning, the POS designs to my knowledge where not deployed.
xii. Equipotentiality - In a potential field, limit position changes (e.g. change operating conditions to eliminate the need to raise or lower objects in a gravity field). (Ex: Spring loaded parts delivery system in a factory)
    1. Ideal example: Limiting position changes within the retailer should enable consistent visibility.
    2. Moixa Energy example: Equipotentiality was considered in the graphic design of the POS as it relates to the position of the POS in the retail environment with competitors (shelf, hanging).
xiii. The other way round - Invert the action(s) used to solve the problem (e.g. instead of cooling an object, heat it). (Ex: To loosen stuck parts, cool the inner part instead of heating the outer part)
    1. Ideal example: As it relates to the overall process we would take each other's positions as our own and gain a better understanding regarding what we were saying. This would have alleviated some communication issues.
    2. Moixa Energy example: As it relates to the development of the POS, the client and I had different approaches and different ideas regarding direction and possible solutions. The solutions were reached through creative conflict subsequent compromise.
xiv. Spheroidality/Curvature - Instead of using rectilinear parts, surfaces, or forms, use curvilinear ones; move from flat surfaces to spherical ones; from parts shaped as a cube (parallelepiped) to ball-shaped structures. (Ex: Use arches and domes for strength in architecture)
    1. Ideal example: Using curvilinear shapes instead of rectilinear parts would increase appeal over the competitors designs and increase sales and visibility.
    2. Moixa Energy example: Spheroidality/curvature of the POS/battery/battery package is not in line with their brand and would add pressure for new designs and extra cost for production.

xv. Dynamics - Allow (or design) the characteristics of an object, external environment, or process to change to be optimal or to find an optimal operating condition. (Ex: Adjustable steering wheel or seat, or back support, or mirror position...)
    1. Ideal example: The design characteristics of the POS and marketing material would be changeable through different contexts such as different types of client interactions like the web and retailers or within home or corporate environment.
    2. Moixa Energy example: The brand could not be all things to all people and while marketing material was designed for different demographics, the task was made difficult by referencing outside brands instead of referring to an internal brand guide.

xvi. Partial or excessive actions - If 100 percent of an object is hard to achieve using a given solution method then, by using 'slightly less' or 'slightly more' of the same method, the problem may be considerably easier to solve. (Ex: Fill, then *top off* when filling the gas tank of your car)
    1. Ideal example: '110' for deliverables is a great goal in order to satisfy the clients needs for material.
    2. Moixa Energy example: The list of deliverables within the time allotted created a priority for doing, not planning. The client knew what they wanted but wanted something 'slick' to communicate it.

xvii. Another dimension - To move an object in two- or three-dimensional space. (Ex: Tilt or re-orient the object, lay it on its side)
    1. Ideal example: Moving the POS and marketing material will be a more effective method of developing an effecting solution.
    2. Moixa Energy example: The design process was consistently in 3D dimension but dimensionality during ideation can be less effective for addressing the branding or marketing challenge when the client cannot see the solution or make the connection why their idea not been seen to fruition.

xviii. Mechanical vibration - Cause an object to oscillate or vibrate. (Ex: Distribute powder with vibration)
    1. Ideal example: Causing the POS or the marketing material to oscillate would increase client value, market share and brand awareness for Moixa Energy.
    2. Moixa Energy example: Mechanical vibration of the POS/battery/ battery package would not address the branding or marketing challenge.

xix. Periodic action - Instead of continuous action, use periodic or pulsating actions. (Ex: Hitting something repeatedly with a hammer)
    1. Ideal example: Periodic or pulsing action of the POS or the marketing material would increase client value, market share and brand awareness for Moixa Energy.
    2. Moixa Energy example: Periodic action as it relates to the POS/batter/battery package was not possible because the design project was limited on time to 3 months. A limited pay and continuation arrangement was suggested by the client but without follow through.

xx. Continuity of useful action - Carry on work continuously; make all parts of an object work at full load, all the time. (Ex: Flywheel or hydraulic system stores energy when a vehicle stops, so the motor can keep running at optimum power).
    1. Ideal example: If all parts of the POS and marketing material worked all the time, it could decrease waste and improve the brand by increasing the environmental recognition of materials.
    2. Moixa Energy example: The POS and marketing material was geared towards specific markets, therefore none of the material could work all the time.

xxi. Skipping - Conduct a process, or certain stages (e.g. destructible, harmful or hazardous operations) at high speed. (Ex: Use a high speed dentist s drill to avoid heating tissue)
    1. Ideal example: Conducting the ideation phase in a fast manner would increase the deliverables with better than expected results.
    2. Moixa Energy example: Although the client saw some benefit for me regarding an ideation/research aspect, they did not believe that it warranted too much time, since design was about doing and that any questions I had could be facilitated through Simon, Chris or previous material on the network.

xxii. 'Blessing in disguise' or 'Turn Lemons into Lemonade' - Use harmful factors (particularly, harmful effects of the environment or surroundings) to achieve a positive effect. (Ex: Use waste heat to generate

electric power)

1. Ideal example: A 'Blessing in disguise' would enable potentially harmful POS material or creative energy to be transformed into a cost saving and marketing asset.
2. Moixa Energy example: While conducting research into the battery brand and getting a better idea of Moixa Energy's brand, I realized that Moixa Energy's brand and aesthetic was so different that instead of developing marketing around other brand's aesthetics, they had a powerful brand that could distinguish them.

xxiii. Feedback - Introduce feedback (referring back, cross-checking) to improve a process or action. (Ex: Automatic volume control in audio circuits)

1. Ideal example: Introducing feedback would enable all design processes to be tested before they are employed.
2. Moixa Energy example: The process of developing a POS solution had elements of feedback, but invariably a solution was achieved by carrying out the client's wishes. Based on my proposal, the client had feedback that weakened the strength of the proposal therefore, I had to reconsider what I believed to be a solution. If the client accepted any of my ideas in moving the POS and their brand together, that would be considered a success.

xxiv. Intermediary - Use an intermediary carrier article or intermediary process. (Ex: Carpenter's nail set, used between the hammer and the nail)

1. Ideal example: Using an intermediary process and carrier would provide more client support to meet their goals instead of standalone solutions and processes.
2. Moixa Energy example: The design process was less effecting without a clear intermediary process that both the client and I were privy to. We started out with different expectations which were only resolved towards the end of the process.

xxv. Self-service - Make an object serve itself by performing auxiliary helpful functions. (Ex: A soda fountain pump that runs on the pressure of the carbon dioxide that is used to *fizz* the drinks. This assures that drinks will not be flat, and eliminates the need for sensors).

1. Ideal example: The auxiliary functions of the POS, marketing material and design process would be more helpful for generating customers, revenue and the brand.
2. Moixa Energy example: POS/battery/battery package serve a marketing, revenue and environmental purpose. Eureka moments considered auxiliary for the client with the invention of USBCell did not see the design process necessitating such a eureka moment, therefore this step was underdeveloped.

xxvi. Copying - Instead of an unavailable, expensive, fragile object, use simpler and inexpensive copies. (Ex: Virtual reality via computer instead of an expensive vacation).

1. Ideal example: The POS and marketing material did not need a long and expensive process when looking to other material will cut down on research and provide proven results.
2. Moixa Energy example: Developing graphic solutions based on market leaders like Energizer and conforming the brand to the media like the Drudge Report instead of retaining key elements of the brand.

xxvii. Cheap short-living objects - Replace an inexpensive object with a multiple of inexpensive objects, comprising certain qualities (such as service life, for instance). (Ex: Use disposable paper objects to avoid the cost of cleaning and storing durable objects. Plastic cups in motels, disposable diapers, many kinds of medical supplies).

1. Ideal example: Cheap short-living objects would provide added value and a method of retaining revenue.
2. Moixa Energy example: Relating the physical POS/battery package/batter the client had an established production that necessitated higher minimum orders for better discounts.

xxviii. Mechanics substitution - Replace a mechanical means with a sensory (optical, acoustic, taste or smell) means. (Ex: Replace a physical fence to confine a dog or cat with an acoustic *fence* or signal audible to the animal).

1. Ideal example: A mechanical substitution would provide the client an optical substitution of the product and brand through the marketing material.
2. Moixa Energy example: Mechanical substituting would increase the scope of the brief and detract

from the purpose outlined in the brief and increase cost.

xxix. Pneumatics and hydraulics - Use gas and liquid parts of an object instead of solid parts (e.g. inflatable, filled with liquids, air cushion, hydrostatic, hydro-reactive). (Ex: Comfortable shoe sole inserts filled with gel)

1. Ideal example: Pneumatics and hydraulics would be considered value added by the customer.
2. Moixa Energy example: There were no pneumatics or hydraulics associated to the product, marketing or POS material.

xxx. Flexible shells and thin films - Use flexible shells and thin films instead of three dimensional structures. (Ex: Use inflatable (thin film) structures as winter covers on tennis courts)

1. Ideal example: Flexible shells and thin films will communicate the product and brand better among the competition.
2. Moixa Energy example: Flexible shells and thin films would not address the branding or marketing challenge.

xxxi. Porous materials - Make an object porous or add porous elements (inserts, coatings, etc.). (Ex: Drill holes in a structure to reduce the weight)

1. Ideal example: Porous material is value added and will communicate the product and brand better among the competition.
2. Moixa Energy example: There is no porous material in the battery or collateral. The incorporation of porous material could be expensive and graphically ineffective given the environmental ethos of the company.

xxxii. Colour changes - Change the colour of an object or its external environment. (Ex: Use safe lights in a photographic darkroom)

1. Ideal example: Changing the colour of the POS would better connect the USBCell with the main market competition.
2. Moixa Energy example: Colour changes were suggested, referring back to the original branding by Turner Duckworth. (http://www.packagingoftheworld.com/2008_04_01_archive.html)

xxxiii. Homogeneity - Make objects interacting with a given object of the same material (or material with identical properties). (Ex: Make the container out of the same material as the contents, to reduce chemical reactions)

1. TRIZ example: Homogeneity within the marketing material and POS would reduce waste and improve the production process.
2. Moixa Energy example: The scope of the design brief did not include a redesign of the materials. The client had set forth the materials (paper) as part of the brief to describe the collateral.

xxxiv. Discarding and recovering - Make portions of an object that have fulfilled their functions go away (discard by dissolving, evaporating, etc.) or modify these directly during operation. (Ex: Use a dissolving capsule for medicine)

1. Ideal example: Discarding and recovering during the design process will leave only what the client would like to see as an outcome. As a piece of collateral memorability over competitors is paramount.
2. Moixa Energy example: Discarding and recovery of the POS and the design process was not effectively memorable because the elements of the brand and brand consistency were not present. They came across as one off's.

xxxv. Parameter changes - Change an object's physical state (e.g. to a gas, liquid, or solid.) (Ex: Freeze the liquid centres of filled candies, then dip in melted chocolate, instead of handling the messy, gooey, hot liquid)

1. Ideation example:
2. Moixa Energy example: Parameter changes would not address the branding or marketing challenge. Changing the state of the POS/battery package/battery is outside the scope of the brief.

xxxvi. Phase transitions Use phenomena occurring during phase transitions (e.g. volume changes, loss or absorption of heat, etc.) (Ex: Water expands when frozen, unlike most other liquids. Hannibal is reputed to have used this when marching on Rome a few thousand years ago. Large rocks blocked passages in the Alps. He poured water on them at night. The overnight cold froze the water, and the expansion split the rocks into small pieces which could be pushed aside.)

1. TRIZ example: Phase transitions would add value to the marketing material and battery.
2. Moixa Energy example: Phase transition as a physical phenomena cannot be applied to paper or the battery without ruining it.

xxxvii. Thermal expansion - Use thermal expansion (or contraction) of materials. (Ex: Fit a tight joint together by cooling the inner part to contract, heating the outer part to expand, putting the joint together, and returning to equilibrium.)

1. Ideal example: Use of the thermal expansion would improve the packaging and POS material.
2. Moixa Energy example: Thermal expansion for the POS or packing material was a production issue that was not part of the brief and it would significantly benefit the brand to change the production technique.

xxxviii. Strong oxidants - Replace common air with oxygen-enriched air. (Scuba diving with Nitrous or other non-air mixtures for extended endurance)

1. Ideal example: Strong oxidants would help improve the production of the POS, battery and marketing material.
2. Moixa Energy example: Production of the batter, POS and marketing material was limited to collateral such as web, brand and print design. I cannot provide assistance for strong oxidants.

xxxix. Inert atmosphere - Replace a normal environment with an inert one. (Ex: Prevent degradation of a hot metal filament by using an argon atmosphere)

1. Ideal example: Inert atmosphere would help improve the production of the POS, battery and marketing material.
2. Moixa Energy example: Creating an inert atmosphere either for design or for production is beyond the scope of the design process.

xl. Composite materials - Change from uniform to composite (multiple) materials. (Ex: Composite epoxy resin/carbon fibre golf club shafts are lighter, stronger, and more flexible than metal. Same for airplane parts)

1. Ideal example: A change from uniform to composite materials would save revenue on the production of the batteries and marketing material.
2. Moixa Energy example: The material make up of the battery and marketing material was set before the project commenced and therefore it was not an option to redesign materials. This would have also changed who produced the materials which was beyond the scope of the design process.

K: Um, from what we talked about yesterday you were interested in where I was going to go with this or at least what's gone on this week.

M: Yeah.

K: To kind of sum up, what's going on this week is that I've tried to figure out er, the best approach for all of it, for everything I mean between the e-mail and the web, not necessarily the web so much but packaging, and so on and so forth, which increase the fonts and the branding and so on and so forth. I know you've been concerned about pieces um that you're looking for, whether it's the packaging or even the e-mail blast, um, sorry, the e-mail newsletter. Um, and I was thinking that it would be easier just to have a look, a feel or an idea for it before I do that because it only takes about, um, it takes a day to do all the um, well okay I'll say four days. It takes about four days to finish all the collateral as opposed to coming up with the idea, which has to start. At this point in time um, because of the way, because of the way this is positioned and the way it looks on the shelf, we can't really tell ?their screen, and we can't really really tell that it's a battery. Um, so I think, I felt when I came in here that this was a pretty good opportunity because it was ???unique. Granted, those are some of the issues. So with that in mind, I think the marketing should probably focus more on some of the messages, some of the clear messages, because even the idea of going with the Dorset and affiliating yourself with the agreement per se, um, you still have to persuade them why they should buy yours instead of the other one. So I think maybe...

M: Dorset is not an example necessarily of that, it's just of kind of like something that's hit just you know, come about. It's managed to hit a sweet spot of, kind of like, it's kind of organic, it's nice tasting, it looks as if it's good for you...

K: Yes.

M: It's appropriate for a breakfast cereal, not necessarily appropriate exactly like that for a battery. It was more the kind of like, ooh, they just got it right, and that's...

K: You never know it till the end, when you evaluate it, and it's... that's right. Um, but one thing that I tried to take away from this is the fact that they do have um, the same colour ?card as you, and they do have, um, they do have at least a natural aura, even though they're not necessarily environmentally conscious at all.

M: Yup.

K: It seems as though they don't just come out and say it. Um, so, I'm starting to feel more comfortable with a statistic and then information as to why they should buy your product, one of which is how many you know, ??? whatever the number is, that um, the number is of disposable batteries. One challenge that you'll probably have to endure is the fact that this can't be showcased realistically with every battery, because there isn't enough room in the retail space.

M: Yep. No, it's more kind of, um, there are different places, some won't, they just say no, sorry, we just got hooked, and that's what you deal with, and in that case, well, this is what we're stuck with. But others will say

yes, there is, you can have you know, a postcard .. [inaudible]

K: So it'll help fill that sort of, it'll still feed the, maybe what happens is that I do a couple of concepts, I'll do one for, ?I think we need to show a person doing it, show a person actually using the product.

M: Yeah, I think ?? a nice pile of batteries? [inaudible]

K: The idea of still having the person showing it, how it's used, is another concept. So you've got the two graphic, pictoral. I think that – by the way, it looks like there's been a change to your website, which is great, um, because...

M: Yeah, ?Simon's been updating it a bit.

K: The changes that you made, um,

M: ...put that at the bottom, that sort of message there, an editable message.

K: This is it.... [inaudible due to background noise]

M: Pretty much the same.

K: Okay, I guess I ?? on and not ????. Okay well, I just thought, at one point in time I made, earlier in the week I made a, I was thinking about how, I just brainstormed an idea and forgot, but when I came back to this one I was "oh, that's fine". It's just that there's a repetition of your, your name, and the other part is that...

M: That's why we left it, so that it finishes like that.

K: But it doesn't. It leaves...

M: It cycles, does it?

K: But neither here nor there. The thing that I saw, ??? produces that even if you don't use, um, even if we go with the graphic ??? as opposed to pictoral, that I think could fit nicely there to where you panned out to showing how it's being used by real people, or at least maybe just a series of two where you have the battery, you have how it charges and then the person using the item, and I think that that's a bit more useful than this, or that, which doesn't...

M: This is our corporate site, so it's not necessarily ...

M2: This is about loss of energy, technologies, which

M; This is what we're doing at the moment.

M2: The corporate needs , you could say the corporate needs a bit more battery stuff on, but it's, it's ah, the corporate side is meant to be about solar panels, and other types of things, um, and to sort of give the ??? that we're doing lots of energy technology.

K: Okay. You were talking about two concepts to focus around, one is to have more of a graphic, why you should buy it, and associate it with one of the things you brought up, ... sorry?

M2: I think there's something nice and powerful about that. Can you bring up the Marks & Spencer's site, Chris?

K: Okay. The other one that I just want to quickly mention

M2; Can you just quickly Google Marks & Spencers ?Plan A? ...Just on that graphic. That's it. So there you've got this kind of graphics with this – kind of very black and white bold environmental sort of stuff where they've got lots of sort of commitments they're making. This is one of our clients. To some extent yeah, something like where the odd ??? 15 billion things are, we can be kind of nice black and white bold statements. I kind of like their style, what they're doing in terms of big bold, you know, statement like a TV screen, sort of – this is bad, this is good. The other site which is interesting just on the environmental issue – if you just go to Solar Century, you Google it, in case I got the name wrong – Solar Century. Okay, so this is another corporate site for a ???? company ????. Now, you try refresh, there's an advert they do that is quite nice. Just refresh it. Maybe you need to go – go to Products and now go back to the home page, Solar Century.

M: So you just put this there as a holder.

M2: Click on that. Then go that to the home. So click on this. And click back on home. Okay – no it doesn't. They've got a nice thing to say something like "nuclear power is a great option, provided you're one million miles away from ?a picture of the sun". So they have a couple of nice simple, bold, black or white - but that is the, these are the sites which are kind of corporate events ??? in an energy company, of which – one of [inaudible] kind of thrown away, now we've got this battery company as well, it's so much bigger.

K: So with that in mind, it seems like what you may have are the options to have, or maybe just the idea to incorporate more people with your product with your future marketing ideas. But for now, for this marketing, we've discovered the graphic of information and some type 2, try and....

M: I would suggest what we need to do now is just, you've got a good sense of what we're like and the collateral, as you call it, that we have already, and what you've got to work with, and what you might need to find.... so I think the thing to do is to just set down some kind of goals for what you – and I think the thing to do next is to say, come up with a series of concept ideas. Not finished pieces of work, but sketches for a series of things. And one of those might be, okay, a graphic text-based, ??one that was graphically-based ??? 15 billion whatever it

is ??? another one might be, what if we went for sort of something that integrated some people?

K: I've actually done that, and the reason why I'm a little apprehensive... okay, I'll do both and then you can look at it. The reason why I'm a little against the people is because a lot of the marketing, when you use people, you're ???? okay, well, this person's having fun, if you just go to [inaudible due to background noise]. Maybe – it's kind of hard to explain. I see where you're coming from, I'll show you the ones I've got, the [inaudible] But, um, what you may end up doing is cluttering it, and what I think is most important is probably the message....

M; Well, I mean, so let's just set some goals for what's um, what you're going to work on in terms of concept design.

K: Okay. Do you still have the timeline?

M: Yeah.

K: So, the second week is supposed to be... okay. Well, let's go to the third week.

M: Well. I think, I don't have an issue with this. I think we're kind of ahead of it, but I think at the same time you're going to return to some of the ??? processes the other [inaudible]. Now I'm thinking what we're doing is maybe like, oh, you might do some of that at the same time. But what would you like to set as goals for things that you would be ???. I think that next week is a time for some concepts. Does that seem....? Setting aside this, this is an outline, see how we go with it, and kind of determine reference to where we are along that line, but is that what...?

K: Okay. The way that you're doing concepts, ideations, the ideation process for me is just to get an idea, a specific idea for a brand and what is it you're looking for.

M: Okay. And I think you're ahead on that.

K: Theoretically until we have our critique of the concept, and what the hell are you thinking, um, so right now where I feel like I'm at is, the reason why I keep coming back to the timeline is that it breaks up, so I'm not all over the place. The thing that breaks up are the tasks, so I can take on a certain amount of tasks, and do that, because if I do all of them at once, and you guys aren't clear on the concept, we ?can't agree on the concept, then it's a lot of work, it's still not the???. So with the three things that you think that were most important for you, which were the point of sales, the banner and the brochure, and you've added the newsletter, that's going to be a heavy first critique.

M: Well the newsletter, that's enough, that'd be great.

K: Yeah!

M: That'd be great. And more or less in that order.

K: Okay.

M: And I would do the newsletter back off kind of the work that you've done .... kind of well, you know, spending an hour, I'm not being funny, but I've done lots of thinking about [inaudible]

K: The ideation process theoretically takes care of those things. It's kind of like – a way of describing it is that we'll take your brand, and we'll take your colours, and figure out how they're being used, a lot of it writes itself. Because I can't change it back, I can't change your font, and you know, the only thing that at times can be a little confusing is how your logo and Moixa Energy is used on this black against purple, the Moixa is purple. But those are things that I figure out are... as part of the branding, okay? That's the ??? we saw, Moixa Energy. It's purple.

M: I mean, that's a secondary, that's a secondary brand, that's a corporate brand.

K: Okay. You had this repeated on your collateral... [inaudible]

M: This and...? Right. So communications that are coming from us to a consumer, primary brand is ??? with Moixa as a sub. It's kind of ???USB subbed by Moixa. The idea that, if we do a licence to the USB sub by ?? in a very similar ???

K: Okay.

M: [inaudible]. That's the kind of general thing. So, consumer facing, USB is always the .... brand. Kind of, when we're facing, um, investors, retailers, so if we were going to see Dixons, ... our communication would roughly be an alliance between Moixa Energy, because we're the company behind USB ..., so then you.... more of a balance. But those are much less graphically intensive communications. [Drill interrupts]. It's kind of much more about general ... [inaudible]. It's much more about the information....

K. Yes. So you're presenting information to them, it's not about the brand or highlighting the graphic. Okay.

M: Yes. You might, in the course of that presentation, you might well have a slide that says "And, see: this is our...", you know, at the point of sale, and we would ?live on that as part of the information.

K: Okay. So there's four items for concepts for next week, and then we don't have another meeting until – maybe what we should do is, you're gone this week...

M: I'm gone this week.

K: Then we have a ?fatigue this week, so maybe you can shoot me an e-mail when you're available for that.

M: Well, let's set one now. Monday or Tuesday, I'm available. Um, I've got ...so Monday or Tuesday's free, so do you want to do...?

K: How about Tuesday? I can send you ....

M: And, you know, feel free to send some things through to Simon if you want a bit of feedback.

M3: It was a graphic wanted earlier this week, there's an e-mail banner for a newsletter, I think.

M: Well the, yeah, just before we can knock one up. In terms of a....

M4: I'll knock one up on my PowerPoint.

M3: Do you have that e-mail I forwarded you with the ?election example? If you go to – I sent three in a row...

M: None of them came through. They did – the pictures didn't come through.

M3: If you click on one of them –

M: No, no, I've tried it.

M3: You deleted them.

M: They're in...You could do a banner.

K; This banner's just for a newsletter?

M: [inaudible]. You want to send a newsletter earlier rather than later?

M3: I was going to send it today, but if we haven't got the ?? sorted out. I wanted to send an e-mail to the – South American people. [Ends]

Symbian group transcripts

START AUDIO

Male 1: Is [Hughsy 0:00:23] on his way or…?

Male 2: He's on his way. He said he'll be fifteen minutes late.

Male 3: Do you want to [check 0:00:33] before the meeting. So you've got, do you want to get [?? 0:00:39] structure. How do they go? Who goes? What are we trying to cover? What's the key message.

Male 1: Yes.

Male 3: That will help us [?? 0:00:53] the indication for the event itself that follows the [?? 0:00:58] accounting [?? 0:01:01].

Male 1: Yes.

Male 3: So I'm dealing with Account, part Accounting people.

Male 1: Yes some of that was said the other day to Andy, he seems quite keen on that doesn't he?

Male 3: He is keen on that.

Male 1: Yes.

Male 3: Alright accounting people so that's the…that's kind of the launch event for the whole idea. And Gareth is putting together in parallel with that a [?? 0:01:20] website.

Male 4: Just a general comment.

Male 1: So objective is, first objective is formally launch Accounting with great fanfare [?? 0:01:39] that's thinking timeframe.

Male 4: Okay, I can do that.

Male 1: Even better than your multimedia cubes mate.

Male 4: Do you want some multimedia cubes?

Male 1: Might need some.

Male 4: I can have a multimedia open sequence. Think about it, glorious. Gets people's attention, sets the standard. Sends a subconscious message that you value what they're about to do because you've spent this kind of money on them. Plus it's more fun. Well what else can you do?

Male 2: Did you have a good night?

Male 4: No. I didn't get drunk. I was quite sober actually I just had about three bottles of beer.

Male 3: The other thing we have to do is to energise the sales team.

Male 1: Yes.

Male 3: With two objectives to this and it's almost two events. And I…in my mind at the moment it's [?? 0:02:38] have in the morning we have Sales. We have some kind of lunch probably and then you have Accounts Teams kick off in the afternoon and then [?? 0:02:52] activity between…

So the Sales Team event will only be say 25 people and Accounting [?? 0:03:00] of them, maximum.

Male 1: Yes.

Male 4: So any other objectives? To add some…

Male 2: I have an objective to that [?? 0:03:12]. We've always had the same [cross talking 0:03:20].

Male 1: [?? 0:03:20] you talk anymore about format now.

Male 2: But it's format but I want… Well I know it's the format but my objective is actually for people to [cross talking 0:03:27] not just to download.

Male 4: Sam go back one step, so what problems are we trying to solve. Because obviously you're doing this to effect change. What's not happening then [?? 0:03:39].

Male 1: So the first one yes the Accountings [?? 0:03:48] today or…I'm putting it in effect actually.

Male 4: And as a result what's…

Male 1: And one of the reasons is that other people in the organisation haven't brought into them. They are doing that and that's why we need a…just a great fanfare.

Male 4: Right.

Male 1: It needs to be this is a special thing. This is the heart of customer intimacy and strategy. This is the how of the what. Because people, you know it came across at the 2012 session as well. People are just asking now, you know we buy the strategy, we buy the book tell us how, how we're going to make, how we're going to do what we're going to do, what we're going to change. And this is one way.

Male 4: So this is where you need support for your tactical umbrella?

Male 1: Yes, yes.

Male 4: Okay. So that's Accounts Team.

Male 2: So I'm kind of at a high level. What you're saying is the strategy is customer intimacy and at how tactical we were and how we do [?? 0:04:54] to the Account Team.

Male 1: One of the ways at least.

Male 2: It's one of the ways.

Male 1: And from a Sales perspective that's the main point.

Male 2: Strategy is world class so how is…

Male 3: Sorry I don't mean to roll back too far but just for clarity the purpose of the Account Teams is to…?

Male 1: Account Teams is a way to effectively manage our customers in a cross functional way.

Male 3: Okay.

Male 1: Basically.

Male 3: So that's communication?

Male 4: Lack of response and all that kind of stuff.

Male 2: Gareth can you…can you just swing round a little bit for me please. [?? 0:05:41].

Male 1: He's a lot more attractive than me.

Male 4: Anyway.

Male 2: See look I've got all my brain.

Male 2: Probably [had lot's of 0:05:56] use.

Male 4: I didn't think about anyone else.

Male 1: And the second one energise Sales Team. What, you know what going back to your questions Gary I mean I wouldn't say we've got a huge problem as such but there is an element of team here not being that well closely aligned or energised together if you know what I mean. Some sort of kind of team [thing 0:06:27].

Because one of the challenges we have right is because in… We're trying to get these cross functional Accounts Teams set up and actually what that's going to do is almost divide the Sales Team as such even more. It's going to fragment it even more because you're just going to have these very highly focussed customer specific Account Teams. And the danger is that you lose a kind of Sales Team on…just through ethics for, you know the rest of it. And it's one of the challenges that me, Hughsy and Sean and [?? 0:06:58] how did that happen and how to manage it as the teams have grown and Drew's got new people, more people. You cannot start to struggle with how to keep that team together. And I think we do need both that's the point. We don't want people to walk away with the thought that your Account Teams is it and therefore there's almost no need for a Sales Team then. Do you know what I mean?

Male 4: Yes I do understand. So you think what because you're going to create these cross functional teams. All the energies going to go and times going to go into these.

Male 1: Yes and that… I mean that does need to happen but we need to retain and probably build a Sales Team.

Male 3: Sales Team identity.

Male 1: Identity.

Male 4: Okay.

Male 1: Is the right word.

Male 4: Okay.

Male 1: I mean I'm not saying it's a huge problem as such but it's just… You know it's certainly an objective.

Male 4: Is there any…

Male 2: I think it is because…. Sorry Trevor because we had at the… You couldn't make it [?? 0:07:57] our team meeting but we asked the team "So what do you want out of this?" And they said "We want to [?? 0:08:05] to what success looks like." There was definitely that idea about the need to build on their identity as the Sales Team even though we acknowledge that the amount of work [?? 0:08:22] work that between the crew, people working on crew plan and people who were working on something else. All…

Male 1: [?? 0:08:29].

Male 5: I guess I have one quick question and it kind of couples with the Account and Sales 50 in the morning and 25 in the afternoon, whether that's flipped. Because the one thing I'm kind of missing here is that you have the Account Teams and the other Sales people but I'm not exactly sure that the hierarchy, if there is a hierarchy or whether the hierarchy isn't spelled out. So you have the Sales Team who receives the major message and they in fact are the communicators and kind of the team builders or is it more like everyone's kind of on a level playing field and you just create this cross network within whether everyone should be receiving Andy's message and having a buy-in. I guess…

Male 2: Oh yes.

Male 1: Yes it's the latter. It's more the latter. Everybody needs to…

Male 2: Everybody needs to get the message that's why they all have to be there for [one 0:09:19] of the events.

Male 5: Okay.

Male 2: But not everybody has the same problem about… I'm the Sales business, I'm [?? 0:09:25] my bonus to get [?? 0:09:30]. I mean we're trying to change that as well but it is about… There is…but it's not about hierarchy it's purely this is my fulltime job if I'm in Sales and my part-time job if I'm in [Symbian 0:09:44] Engineering. So it's trying to build an identity for the people who's fulltime job it is to do the selling.

Male 1: Yes but I think, I mean Kevin's is a good point. So if we do it like you said here, format, structure it like that then Andrew normally gets up and does his "What a great year we've had and this is what we're doing next year." Bit. You know the people, you want the people in the afternoon i.e., the rest of Symbian to hear that as well. So I mean may be, are you suggesting maybe he saves that for the afternoon bit and in the morning bit we do something else?

Male 3: Don't know we'll have to work out how it works but there's a desire from the Team to have that kind of personal, more intimate time.

Male 5: That would also make sense because if they have a personal time with them and have the connection then they're the ones actually driving the Sales and have to communicate it down to the people who are doing it part time. So that they get a distilled message on what's relevant to them and that… But the thing is, is that there's still….because they're only doing it part-time there's still going to be at least from my point of view a lack of cohesion for the others that are like, you know what is their buy-in. So it's almost like a separate message about how they belong, what their integration is and that's why I'm saying I'm missing a bit of a hierarchal idea of what is their buy-in and where is their place within this. And then how's that.

Male 3: I agree with all of that except the word 'hierarchy' [?? 0:11:08] there is a hierarchy.

Male 5: True but even the dissemination of information comes from the top and filters down.

Male 3: Why?

Male 5: Well I mean…

Male 3: [?? 0:11:18].

Male 5: Well in this case there's a certain amount of emergence from the bottom saying this is what we need. That's taken into consideration as far as what [?? 0:11:25] vision is that, I mean I don't mean hierarchal in this case as a bad way but it's a point of view where Andy creates a vision for the rest and that.

Male 1: It's just distilling the message that of disseminating the message whether it's a cross or up and down.

Male 4: So the point is the big call to arms should be to everyone and it should be first. And then break off into lower bits later.

Male 3: Could be first class if that's… Could be.

Male 5: But what is the message?

Male 3: So the…I think the message [?? 0:12:00] Sales Team is…you have to be a driving influence in getting customer needs, identifying customer needs and making sure they go with the organisation. For the Accounting you have to take responsibility for delivering that [?? 0:12:19].

It's like, it's the… Think about an Accounts Team [?? 0:12:27] Sales [?? 0:12:29] Finance Teams, each one of those will have their own ways of dealing with their own function and expertise, right. So we're not going to train all these people. It doesn't make sense talking to the Account Team about details of

Symbian processes. That's the Software Engineering Team and that's Hardware.

So although we all want them to be, to take a customer view, the [defunction 0:13:01] expertise of the Sales people is different from the expertise that might ultimately bring… I don't know if that makes sense, does it make sense?

Male 5: And I totally agree with you but… And I guess what I'm reiterating is that there's an overall message that both of them buy into what they have in common.

Male 3: Yes, correct.

Male 5: And perhaps that's what's actually disseminated either earlier or later is just… And not to brow beat this but in my head what I'm thinking is that when the Sales people meet with Andy, Andy specifies "Well look we had a great Sales year this is what we'd like to really push for." And may be the Sales Team internalise and says "Well this is how we'd like to see it first. This is how we want to take care of the Account Reps." The Account Reps come in and they're like "Hey how's it going?" And the Sales Team is like "You know what this is the message that we've got reiterated by Andy. This is how we've internalised it. This is how we see it how do you feel about it?" And have that conversation because it's kind of like how the Account Reps would hear Andy listening to the Sales Team or presenting to the Sales Team. It feels that so it would be different from the information that they would need or that they would hear.

It's based on…

Male 3: It'll be the same information.

Male 5: Okay, okay.

Male 3: And even if we say it twice because that's what happened [?? 0:14:19].

Male 4: You want to unify the teams, create a common camaraderie, esprit de corps, all that good stuff.

Male 1: Yes.

Male 4: Now that's going to be a very, very simple piece of messaging which Andy should deliver top line at the start of your programme. It should be his "This is the big drum beating, this is what we're going to do. This is the vision, this is how we're going to get there." And get, you know… And Andy's bloody good at this. He talks as well because he's got to know but you've got the talent, I mean you [?? 0:14:51]. You know what I'm saying, so…

Male 2: It's easy for you to say that.

Male 4: Yes I know.

Male 2: There's six of us, wouldn't be able to say this.

Male 4: Yes and I'm back in vogue. Chips that's right. Want to go and sit for lunch. Basically that's the important.

Anyway so what I'm saying is… This is probably a bit of stagecraft here.

Male 2: Yes I agree.

Male 4: Let's give it… You guys want… The messages here are quite simple he wants to energise the team, report success, communicate the change that's going to be to make us more successful and also to acknowledge things like actually this is going to cause a bit of fragmentation but we want to see as much of there's a strong spirit for the team moving forward. Then he starts introducing the things that he wants to change.

Male 1: I think that's an important one to pull out. So acknowledging or announcing that it's going to require people to change some behaviour that they're doing today.

Male 4: Yes.

Male 1: Right.

Male 4: But you're right at the heart of this now. The whole reason you guys are putting this together is because you need some change to happen. And this is the mechanism and vehicle by which you effect the change.

Male 1: Yes.

Male 4: So what happens just as a… Sorry it's a very stupid question, the Account Management Team and the Sales Team when they're briefed at separate times of this day. What's the difference? What's happening different? Why is it? Why aren't they all being kept together the whole day?

Male 2: It's because if… What's happened in the past I've… It's very clear, everybody thinks the same way. It's a fantastic event for the Account Teams. The Sales Teams get nothing out of it and they're bored shitless because it's the same stuff, nothing new. There's nothing in it for them. They may as well not go.

So it's not energising. It's not…it doesn't help with team spirit. It helps… Actually there's nothing there. It's a great…what we've done in the past is a great vehicle to communicate what we want [?? 0:17:04] view. And what they miss. So the problem is if they miss the sense of "Well we don't have an identity. I know what you [?? 0:17:19] as a company but why do we exist as a functional team? What does Andy want from this, these 25 people?"

Male 4: And is that so different from what's from the Account Managers?

Male 2: No it's not but…

Male 1: So on the terminology right. So I think the Account Teams are the cross functional, the rest of the company, right so… And the Sales Team is obviously just this here so it's not…

I think what we're trying to say is effectively I don't think the messages will actually be that different frankly.

Male 4: No.

Male 1: But there will be a slight difference in the sense that with the rest of the organisation there it'll be kind of… It is formally launching the Accounts Team getting their buy-in to that, energising them to do that etc. Asking them to change etc. So with the Sales one it's more about making those people more aligned, right. And trying to create what we talked about that identity and ethic within the Sales Team. So that's very specific it's Andy saying this is what a great Sales Team looks like as opposed to this is what a great Accounts Team look like and it's two different things.

Male 2: So take the company kick off for example. Say the company kick off is really an HR thing. I think last year was a values… [?? 0:18:58] by Richard.

The… So HR has this huge massive event which is aimed, geared at the whole company. If that's the only event the HR team has for the entire year would you…do you think you would bond with an HR team?

Male 4: No.

Male 2: And that's it.

Male 4: Okay I take your point. That's it, yes.

Male 2: So it may mean that if we struggle in this room to find out how we're going to differentiate. It may actually mean we'll have to have two days.

Male 4: Well I've got an idea so I think having heard what you've got to say is that we need to energise the Sales Team to act proactively to do what they're doing really really well. But also to add fire to the Account Teams.

Male 1: Well that'll lead in the Account Team, right?

Male 4: Yes.

Male 1: They'll have Ambassadors/Leaders.

Male 4: Well with that in mind you launched the Sales Team, you basically orientate everything towards the Account Managers who are going to turn up later to lead and shape these Account Teams. You actually tell the Sales Team they will be the guys who are actually going to make this happen, you know they are basically the head of the operation. The rest is the legs and the body.

Male 3: Yes. That's not really true.

Male 5: I have a question. If the overarching thing is to launch the Account Team, if that's where most of the fire's going into then there probab-, may be there should just be a break out later for Andy and the Sales Team and have it underneath that one. And say "Okay we're launching the Account Teams but Sales Team we're going to take some special time to actually have a personal connection with you." And it doesn't have to impede on the overarching message but it can support it.

Male 3: Yes. I wouldn't do it as a break out. Because if you break out the Sales Team separately then you have all the… Then you reinforce the divisions. I would have it…so that's more the idea was to have different slots where we have one slot for 25 and that was going forward.

Male 1: No I like the way you structured it there because I think basically we need to have it very small at the start, have it Andy with them all. Have it Andy to the Sales Team only and then invite the rest of the people in and do the formal Account Team lunch.

Male 4: Except you're saying to the Sales Team, what you're basically saying "Okay this is the start. These are the most important, these are the special people." Even if that's…you know. Has to [cross talking 0:21:40] a little later.

Male 3: Let's just summarise [cross talking 0:21:42].

Male 5: That's alright.

Male 3: We…Account Team could go first and kick off [?? 0:21:50] objective I think there are two objective. One is to formally [?? 0:21:56] launch the Account Teams and that's actually the main activity of the day but we're also beginning to energise the Sales Team. And to reinforce like "Well you guys have functional expertise which is different from the expertise of [cross talking 0:22:14].

Male 1: No I understand. So I mean Sales Teams, Sales kick offs are typically for this sort. You know in other companies are for the Sales Team.

Male 3: Yes.

Male 2: But they're not in our Team.

Male 1: They're not in ours no.

Male 2: The point you were saying before.

Male 3: And that's exactly what we've highlighted. So Gareth then said okay "Well step back if you have these objectives what are the problems you're trying to address, it's that one." And it's not so much problems for the Sales Team I don't think.

Male 1: Yes.

Male 3: But there is that problem of the fact that the Accounts Teams don't exist on their own.

Male 1: Yes they need to be rolled out now.

Male 2: Yes.

Male 3: So that's why we're creating that. Then we had this discussion about the company strategies quite clear, it's customer intimacy is world class but that's the why. But how, the tactical is very unclear. So we aim to do Accounting yes but how. How…and we need to manage the customers cross functionally but how. What are the common objectives we have. What…how do we reinforce the Sales Team identity given all this. So [?? 0:23:21] is linking the top levels strategic of the [?? 0:23:27]. And then we identified that we're actually are asking people in the company to start changing behaviours.

And then we had a sort of diagram there very indicative of a… In the past we ran it as one event where everybody engaged from the morning and afternoon and the evening. And the Sales Team are saying "Well that's great for the rest of them but we get nothing out of it. It's just repetition." So we're suggesting to have some kind of may be a slot in the morning where there's just Sales people, in the afternoon everybody or the other way round. Or…

Male 2: I think [?? 0:24:13]. I think starting off with the Sales Team is a bit better.

Male 1: Yes, yes.

Male 3: Or even having two [?? 0:24:18] but this could work. I mean this has been my thinking so far.

Male 2: What about… Basically an objective also sort of traditionally what we've done is informed generic company, senior management. That's something we're going to miss if we… Because not all the senior managers, people who we'd invite would be at the Account Teams, yes.

Male 1: Yes.

Male 3: Because the audience would be?

Male 1: I don't think, I mean I don't think we're very clear. I don't think we're limiting the invitees to just those Board.

Male 3: Okay.

Male 1: Well okay, that's a good point. I suggest not at all.

Male 3: Yes, good point, no. Because I mean Dave, like you say the [SLT 0:25:06] all the members of the SLT, all the VPs who aren't on board sort of they still need to know what's going on. I mean everybody wants to know what's going on with Account Teams.

Male 3: It's actually Account Teams, Sales and really VP level?

Male 2: Yes.

Male 1: Typically the invitee list isn't it.

Male 2: So you want…

Male 4: So let me…

Male 3: We have to be very careful about that whether you dilute the impact of… We're asking you to do this job but you can just listen. You have to change your behaviour and don't actually know where it's going. You have to be very careful about this.

Male 1: Yes.

Male 3: So…

Male 4: So my observations so… I mean my observations so far and I don't, you know I don't know anything about your teams in depth but this is just about getting emotional responses and getting the buy-in that you guys want. And the energy of what you're wanting to [do with 0:25:59] the teams is that you want separate messages.

Male 1: All the bits that are pink and fluffy.

Male 4: Bit soft, that's right.

Male 1: The emotional response is going mate.

Male 2: Okay.

Male 1: You just organise the day.

Male 4: I've only just got started. So…

Male 2: No you missed the multimedia pitch before. It was a massive miracle.

Male 4: Between the two of you I just thought this was a meeting so…

Male 1: Mark's very in touch with his soft side.

Male 4: So…

Male 4: In open air, come on.

Male 4: The point is we want, you want it…you want to sit down with the Sales Team. I would say that at a certain point, probably the start of the day there should just be the Sales Team and that's it. And it's Andy and whoever, talking to them. And it's about vision, it's about energising everyone around the big ideas. It's getting people to not just agree with it in their heads but to actually feel something. And that's when you've got proper engagement because it's just…

Everyone in the company intellectually agrees with what we're doing. But most people are a bit confused about what they feel about that and that's come out in the [employees' 0:26:55] satisfaction survey, it's really strong actually. And consequently the action is spread or diluted or fragmented or disjointed.

So what you want you want to give…and Andy can do this because he's a good speaker. You want to give them a good strong vision. You want to tell them what they're fighting for, tell them they're the best people in the world to possibly do it. There's no one else that can actually do it. Whatever works. Then we structure everything else, you know other people will be coming in today. They'll be Senior Leadership Teams, we'll be getting the Account Teams in as well. Your job is to educate and lead these teams and add the fire that has been lacking etc. Whatever you're going to say to these guys.

Because without the Sales guys and the Account Teams these teams don't work, am I…I'm right yes? They just don't work.

Male 1: Yes.

Male 4: They can't. So you're the [?? 0:27:36] that's kind of how it works I would say. I mean obviously that has to be edited for…

Male 2: Yes. No you're right…

Male 1: I think one thing to pick out that we just need to make sure that is rotation on Account Teams. It's not a god given right you'll stay on an Account Team and also people will be rotated around.

Male 4: So that's how you solve your problem.

Male 1: And it's around…and it's not around people on the Account Team it's about the actual function of it.

Male 4: Right.

Male 1: So I think one of the mistakes on Account Teams in the past is we pick people because they're good, yes. As opposed to their role as appropriate to contribute.

Male 4: Yes.

Male 1: So in an Account Team you actually have to frankly accept a few people that are may be you would consider not to be the greatest person but they just happen to be in the right role. If they can't perform in their role that's a different issue, yes.

Male 3: Yes.

Male 1: Do you see what…?

Male 3: And [?? 0:28:36] about decision making I know one of the objectives for Andy on this is to stop everything bubbling up [?? 0:28:42].

Male 1: Yes, yes.

Male 3: If you need resource for work on R, not that [?? 0:28:49]. You need to be able to go to [?? 0:28:55] and actually allocate them.

Male 1: How?

Male 3: At resource.

Male 2: People should be more empowered with this.

Male 5: I have a good question, was there ever a survey done beforehand so this ends up being more of a conversation or continuation of the communication. So it's not just kind of a starting point. So when you guys were talking about how are they effective? What does success look like? Are these the end of a previous conversation that could be kind of like said "Okay this is where we were, these are the things. We heard what you said. This is tactically what we plan to do in order to take care of that. That taking care of it includes the launch of this Account Teams." And, you know obviously that goes…that's disseminated to everyone but the private message between the Sales people is perhaps a little more potent.

But anyway I was just more interested in is this…was there a prior conversation that people are going to be able to pick up on?

Male 3: Yes.

Male 5: And is that communicated throughout this so people can just kind of buy on board and say "Yes I remember this."

Male 3: Now we have 25-minutes. We need to basically [sort it out 0:30:02]. [?? 0:30:03] five minutes what are we going to, we're going to book an event. We need to take the advice of what people are saying. Got the diary out, block this day out. We need to get speakers in. Decide on [?? 0:30:16] speakers are we going to have. [?? 0:30:19].

So in the next 25-minutes we have to decide the format of the day, review what the objects are for events and rough [?? 0:30:31]. Let's break out into your groups.

Male 2: My terms?

Male 3: Yes.

Male 2: As an overall structure I like what you did before. The Sales Team only and then inviting the rest of the company in, may be broken up by a lunch so that you can get people coming in for lunch and then you start. So may be start it at I don't know is it 10.30 or 11.00 till 12.30. I don't think you need long that morning session.

Male 1: No I think two hours, 10 till 12.

Male 4: Yes 10 till 12, then two hours.

Male 5: Okay.

Male 3: Then lunch and then [?? 0:31:05] current teams, go and join them for lunch or join after lunch?

Male 5: I'm going to suggest may be one hour earlier because part of this thing about taking care of the Sales Team and making sure that they're number one and doing all these things. I've got an idea about mind, body and spirit. Okay all that stuff aside, I've scheduled massages for the Sales Team before the other Account Teams come in just as a bit of a perk.

So they have this message, they have a massage, they have their lunch. The Account Teams come in and… I mean it seems like a strange side note to have that kind of event but…

Male 1: It's getting really freaky now.

Male 5; They're not going to hug pinkies and light candles.

Male 2: It's amazing there's massage.

Male 1: I'm very in touch with the massage. I'm actually going for one tonight so there you go. Off you go.

Male 5: The thing is that it also helps facilitate the message. So it relaxes them, it opens them up and as opposed to going from one meeting to the next one, it breaks it up in a way that… And it's not, it's going to be physically non intrusive. Obviously it's a choice but it's something that is (a) little bit decadent, (b) when you get a massage it relaxes the body physically. It'll relax you mentally and in the… I mean I know it sounds like a bunch of fluff but it actually does work. There're certain things that you can do to make you more receptive to messages.

Male 4: I think it's grand I really like, I think that's… It's good to try something like that. It'll make the day unusual and memorable.

Male 1: It'll be a bit odd but you want to keep it completely secret I would say…

Male 4: Yes.

Male 5: Alright. And the other thing that I've added is that there are ten minute cards added for everyone. So when the Account Teams come in they get a card and they can go to the same place and get a 10 minute massage. Because obviously they're going to say "Why…"

Male 1: How many people have you got in massaging?

Male 5: Sorry?

Male 1: How many people are coming in to do the massaging?

Male 5: I believe five. So we do it in an hour. So the hour, you know…

Male 3: So you get 10 minutes, five people at a time in the course of an hour.

Male 1: Full body?

Male 5: Okay. Let's not make this more than it is but yes it's something that I thought might be a good idea in order to just…

Male 3: I like it if we can get…if we can weave the message in all of that. If we do have a…if we can build the message. It is about you, we want you to be successful. You have to take the time out. Part of being successful is [?? 0:33:38] or something, whatever. However you build it in…

Male 2: I think it can be done [?? 0:33:46].

Male 1: Alright. So go through the structure again.

Male 3: Okay…

Male 1: I just want to check, are you sold? Are you sold?

Male 2: Yes.

Male 5: Morning session.

Male 1: Your team will love it.

Male 5: Morning session either 10.00 or 9.00 am till 4.00.

Male 1: Something we should try at least.

Male 2: Yes let's. We've done the Go Karting. We've done something very boyish let's do something…

Male 5: Okay. Just let's take it from the top. Starting nine till ten or ten till eleven because I felt the pause in the room. Ten till eleven morning session with Andy, Sales Team of 25 goes for an hour.

Male 2: Before we do the time. Before we do say nine o'clock let's just make a list of what we want to happen in the morning before lunch.

Male 5: Okay.

Male 1: Yes.

Male 2: So we want, if I'm right. One talk by Andy?

Male 3: Definitely I think there's no question about that.

Male 1: Yes.

Male 2: Talk by Nigel, [?? 0:34:53]. Do you guys have something, interactive session?

Male 5: Are you going to have the audience, the other upper level not the Account Teams but any of the VP level at that point of time listening to this or no?

Male 1: Sales only.

Male 5: Okay.

Male 2: Sales only. Sales only just Andy no Nigel, no [?? 0:35:16] isn't it?

Male 1: Yes.

Male 2: I think it's, yes it's just more [?? 0:35:18].

Male 1: Yes. So I think yourself and Peter are included.

Male 3: Yes, Alan, Heather.

Male 1: Yes.

Male 2: Sean and his crew.

Male 1: Yes. But that's it.

Male 2: Not customer generics.

Male 1: No, not at all.

Male 3: [?? 0:35:41].

Male 1: You want somebody from Training.

Male 3: You don't want them [?? 0:35:50] company.

Male 2: He's fine.

Male 1: That's details.

Male 2: Yes we can argue about that.

Male 3: Let's see what you [?? 0:36:04].

Male 1: Alright who else do we want? Andy. Who else do we want?

Male 3: Do you want presentations or do you want something proactive?

Male 5: I would probably argue (a) if you have something interactive have that after like a personal message from Andy. Just try and make the connection as simple as possible. And then if you're going to do interaction may be pull out the bells and whistles when the Account Teams come to keep the Sales Team interested, keep them present. And make sure that it's very engaging.

I don't think you need it straight away in the morning. I think Andy's message should be enough.

Male 1: Is [?? 0:36:49] coming?

Male 2: Yes.

Male 1: I mean I always like the ideas of an external speaker to be honest. I mean external speaker.

Male 2: Yes.

Male 1: I think, you know I think get in a [?? 0:37:06] but getting a… Either a motivational speaker or a…

Male 2: Yes.

Male 1: You know, this is how we do Sales in our industry, example. It needs to be connected to our industry, do you know what I mean but it's…

Male 5: You guys are talking about launching the Account Teams there I mean…

Male 2: No, not yet.

Male 5: Oh just for the morning, just the Sales Team.

Male 2: Just talking about the morning [?? 0:37:38].

Male 5: You having an external speaker for the morning as well?

Male 2: That's…

Male 5: Theoretically.

Male 1: I don't think we're going to have an external speaker for the afternoon.

Male 5: Okay.

Male 3: So an external, [?? 0:37:50] and then spend an hour. And then do the link to…

Male 2: What do you reckon?

Male 1: With an external speaker? Yes someone like Head of Sales for Airbus or someone like that.

Male 2: Exactly yes, that's what I meant yes.

Male 1: Someone that's [?? 0:38:17] industry or…

Male 2: Or Rolls Royce.

Male 1: Yes.

Male 2: [?? 0:38:22] would probably be more.

Male 1: Rolls Royce, yes.

Male 2: Actually [?? 0:38:27] like we're almost.

Male 1: Rolls Royce.

Male 2: And the airline industry.

Male 1: The airline engine…

Male 2: Do passengers really care or, you know whether they're Rolls Royce or GE.

Male 4: [?? 0:38:37].

Male 1: Yes. It's basically someone that does large corporate selling of millions of dollars and is at Board level decision.

Male 2: And you're… You're not a brand that's that visible actually to the end user.

Male 3: Yes.

Male 1: Yes.

Male 1: Okay so how can…

Male 2: Unless [?? 0:39:01] got Rolls Royce or GE engines.

Male 3: I think we should meet up with Graham and [cross talking 0:39:09].

Male 2: But really the external and I think for me that's it. I don't think you need any interaction or kind of…

Male 3: And I get a head massage.

Male 1: I mean I think… A review by yourself of the numbers. I mean Andy…

Male 2: Can't Andy do that?

Male 1: Andy can do that or…

Male 3: But keep it short, yes. So two or three things and then a connection to… It'll be very important to how you make this connection to by the fact that you do a head massage and you're very comfortable.

Male 1: Yes.

Male 3: And there will be no effect. Then lunch. Then we get all the Account Teams joining.

Male 1: They come for lunch I think as well.

Male 3: They come for lunch?

Male 2: But where are we going to do this?

Male 3: [?? 0:40:10] the suggestion, I have these [?? 0:40:15]. They have [?? 0:40:18] there [?? 0:40:20].

Male 2: Yes I've found it's good.

Male 3: Have you been there?

Male 2: It's part of the [?? 0:40:24]. It's like the Tower Bridge, part of the same group but it's better.

Male 1: Whereabouts is it?

Male 2: Marble Arch.

Male 3: And they have…the reason it's a good venue is because they have the conference rooms, the venue for lunch is called…I forgot what it's called. I have pictures here. It's basically a…it's a cafeteria style luxury [cross talking 0:41:00].

Male 2: Wicked, we're sold mate. Move on.

Male 3: That was fine, yes.

Male 2: I'm sure the lunch will be great.

Male 3: And what's quite nice about it is they have different world food there so you can have [cross talking 0:41:12]. So there's kind of an all global theme at the lunch as well.

Male 2: Ah that's good, alright.

Male 3: So do note to myself – Account Teams join before lunch. And then we have the afternoon presentations [?? 0:41:36].

Male 1: So I don't…what I really don't want to do is write on post-it notes and put them up on a board.

Male 3: No because that's what happening on today's event.

Male 1: Right, okay.

Male 2: What your reasoning?

Male 1: I just find it…it just infuriates me that no one ever does much with the said documents afterwards. I just wonder if there is…

Male 4: You've just been there one too many times.

Male 1: Yes, yes. Anyway we can talk about [cross talking 0:42:06] in two days time.

Male 3: But what we…

Male 1: Probably say "Oh okay…" You'll know how it'll be.

Male 3: What we could do is to have break out sessions with the Account Teams.

Male 1: The only issue well with the format, yes. Is these Board level teams and then there's the Account Teams

underneath. So it's going to be quite a big…

Male 3: Ethical…

Male 1: [Jo Bennam 0:42:29] [?? 0:42:30] chop her up into fours.

Male 2: I don't think you can split it.

Male 3: So you can't.

Male 2: You can't split it up.

Male 3: That's a shame but yes.

Male 2: You could do it at the level down. Actually you couldn't because I think it's the common… There has to be common things.

Male 4: But hang on a minute what are you… Going back to the objective of what we're trying… So these guys are coming in, we've revved up the Sales Team they're all feeling very good.

Male 1: Yes we now need a storming launch to the Account Teams. So there again it's an A/B. I mean it's an A, Andy kick off.

Male 2: Andy kick off.

Male 5: The speaker that you're bringing in it's just to the…

Male 2: The Sales Team, yes.

Male 5: Okay well the message, the overall message of launching the Account Teams and why it's a benefit why is that not…? Why can't an external person like say from Airbus or Rolls Royce say "You know we've done this you guys are following a good track. We did it better but…" Sorry just kidding but whatever. Because it seems like as opposed to becoming specific.

Male 2: Ideas there to have an internal speaker is wrong. We definitely want Andy, definitely want John.

Male 1: I think it all depends on if we can find the right external speaker and if they can they could slot in.

Male 5: Well also theoretically what is it that you want them to say? I mean have an idea of what it is that they want to…

Male 3: Keep in mind the point of the day is to make this link between strategy and tactical.

Male 1: Yes.

Male 3: Yes. And this we kind of have a grasp of, this we don't.

Male 1: It might be yes…

Male 3: This is what we should focus on.

Male 1: The external speaker might be a good way to close the event. So that's the other option.

Male 2: Yes that's a good idea. Because as long as what… The other thing we suffer from with these events is people just drift off. They have to stay for the whole lot, right. So you might need to, you know… One of the ways of not [?? 0:44:23] avenue is to have a buzz at the end rather than it just petering out.

Male 5: Can it be condensed at the end and then have the event thereafter so they can… I mean you guys are talking about… Well there was talk about whatever event that you do as a group that's supposed to be recreational. So does this…do you kind of shorten the middle and say "Okay this is the take home message. This is what we want you to take away." Now we want you to go ahead and physically implement this within this activity, you know. That's the underlying message for whatever it is that you guys decide to do.

Male 2: Do you want Nigel to speak at all in this. This is not optional, this is…

Male 1: This is a business initiative, not a Sales initiative?

Male 2: Yes.

Male 1: I like that quote, it's a great quote.

Male 2: And if you don't want to do it that's fine go and work for someone else.

Male 5: We've taken all the fun [?? 0:45:19] out of it.

Male 2: Yes I know.

Male 1: No I mean yes you're right. This should be the message. It doesn't have to be said like that.

Male 4: Well hang on a minute, following on from that then. So if we're building up, we're building up around this team. We're trying to get them serious, energised, motivated. Why don't we… We've got to do something kind of fun which isn't… Doesn't involve breaking out. Why don't we make them, each of the teams introduce themselves to all the rest of the teams. So it has some definition here.

Because the start we're talking… Right so you're getting your Sales guys, the Sales guys, almost Andy could sell it in. The Sales guys are the captains of these teams, they're the athletes of these teams, yes? And…

Male 1: No that's…not really.

Male 4: No, what are they going to do?

Male 3: They participate they don't necessarily have to lead the team.

Male 4: They don't lead the team.

Male 3: They don't have to lead the team.

Male 4: Okay. I know [cross talking 0:46:05].

Male 3: Of course they will.

Male 1: It doesn't have to be clearly stated though.

Male 4: Okay, alright. So…but alright. So just back to that other idea then.

Male 3: The reason is that you have VP level across the organisation on those teams and the Sales person may not be…

Male 4: Does that matter?

Male 3: No.

Male 4: No.

Male 3: But it's [?? 0:46:28]. I mean…it's not a Sales initiative, it's a business initiative.

Male 4: No of course not.

Male 3: And so that [?? 0:46:34].

Male 4: Alright. So what about introducing the teams then to the rest of the teams. So you actually have some sort of fun way of doing it.

Male 3: So we've done this type of thing [?? 0:46:44] I mean sent my managers down there, given us 20 minutes [?? 0:46:49]. Something like that that could be Accounting rather than each Account.

Male 5: Or finding a different way of delivering it. May be it's a video feed within some…find a different way of communicating the information that's engaging using perhaps multimedia. Some play, some different way of looking at it that does interest you. That also takes into account the technology that they're using. So may be it's a video feed, may be it's a… You know it's something organised and interesting, i.e. off the top of my head I'm not really coming up with anything. But there needs to be either a different way of doing that if in fact you're trying to introduce them and all this other stuff.

But I'm getting confused with the messages of launching an Account Team and then having everyone introduce themselves. Well I mean that kind of makes sense but you still have… Or do you still have an activity where everyone's introducing themselves. I'm getting lost with the end. The beginning I'm totally on to but…

Male 2: Yes I… In a way I don't think it's necessarily but it's 50 people who all know one another. We know who the Accounts are. It's more a question of they don't know what the job is.

Male 1: Yes.

Male 4: I mean you could do something fun like what I was saying, like a piece of multimedia, you know you could introduce each of the teams with a bit of animation and sort of, you know have it… Like Top [?? 0:48:12].

Male 1: Yes, yes.

Male 4: So you pick out your team members and it's like the special skills x, y, z, x, y… Do you know what I mean? It could be something like…

Male 1: I'd agree yes.

Male 4: Just to consolidate it and then at least everyone goes away knowing that they're part of this thing and they're quite serious and you know state the goals of each team.

Male 2: Yes.

Male 4: Have you heard of Top Trumps?

Male 2: This is a crap team.

Male 4: Have you all heard of Top Trumps. That kind of card game for kids?

Male 2: The card game, yes.

Male 4: That kind of idea.

Male 3: So one of the activity…if we were to do another activity on over and above the massage, head massage in the morning there are two ideas that we can [find and incorporate 0:48:52] either one or the other or both or none. One is to have a bit of a local treasure hunt either walking or with taxis and you get text messages to direct where and you all meet up at the final one. The second one is that in this hotel there's a…quite a hi-tech trendy bowling alley.

Male 1: Wicked.

Male 3: So you could.

Male 1: Bowling's great.

Male 3: You could do something about… You have a bunch of teams, have this kind of idea. You pick people based on their skills and then you go bowling and have a bit of a competition sort of thing.

Male 1: Yes.

Male 4: And the teams play against each other?

Male 1: Yes.

Male 2: Yes.

Male 4: That would be really good.

Male 1: I quite like that more than the treasure hunt.

Male 2: Yes.

Male 3: [?? 0:49:49]. I think it's quite a bit better than the Trocadero [?? 0:49:55].

Male 2: I think less is more here if you know what I mean.

Male 1: Yes, yes I agree.

Male 2: I don't think we need to go… As I say I don't think it needs to be five hours of PowerPoint presentations.

Male 1: Yes.

Male 3: [?? 0:50:08].

Male 2: So you could have a…

Male 3: The only comment I have on the line that we have here is all of that stuff is this. We could…John will be great to speak about the strategy.

Male 1: We need a practical session on how it'll work.

Male 2: Yes.

Male 1: What's expected of people, you know.

Male 3: How does that work?

Male 1: How would it be organised? Who will organise it? Yes. When will we meet?

Male 2: Yes.

Male 1: What's expected of us, yes.

Male 2: I don't know if you need those three, all three of those – Andy, John and Nigel.

Male 1: No I think…I think what you could do is you could get Andy to present, yes. Because I think it's fair he presents then Nigel stands up. May be [?? 0:51:04]. A little instruction via Andy then may John Forsythe. Then at the end of John Forsythe's pitch Nigel just gets up.

Male 2: We just want an endorsement from Nigel.

Male 1: Yes just like…you know.

Male 5: So mainly the afternoon is team building mixed with the message?

Male 1: Yes.

Male 5: Which still keeps it energised and still launches the team?

Male 1: Yes.

Male 5: Because you don't want to get bogged down in all of the semantics of it and then leave thinking "Oh god we have a release, bowling. Let's forget everything that happened before."

Male 2: No. So then moving into a practical session of logistics of what it means to be a …

Male 1: Who would do that?

Male 3: Is this when [?? 0:51:51]?

Male 2: No, no I think it needs to be… I think it's us.

Male 5: And may be if there's specific information that you want just create a piece of collateral that they can take away to review some of the things. And how it's going to be rolled out.

Male 2: [Cross talking 0:52:11].

Male 1: Again, give them a take away, a physical take away – a cube, an accounting…

Male 5: Or even download something into their phone.

Male 1: Both.

Male 5: Okay. I mean…yes.

Male 4: They need some sort of Mission pack thing to take away. So they know that this is the stuff we need. This is…like Mark's saying this is actually how it'll work. This will be the person that organises, these are the outcomes.

Male 1: Because you know the minute you say [?? 0:52:42].

Male 2: Yes.

Male 1: Right.

Male 4: But you guys will or have got all that worked out I'm guessing?

Male 2: We have…

Male 1: In the process of…

Male 3: We have five minutes…

Male 4: Yes I mean it's within your…

Male 3: I'd like to summarise, dish out some actions and then we'll go, yes. So I'll write this up, I'll clear it with Andy.

Male 1: Yes. Who's going to do that?

Male 3: [?? 0:53:18]. Get a guest speaker. Invite delegates.

Male 1: Delegates.

Male 3: Assign the [?? 0:53:44]. [?? 0:53:47] phone download.

Male 2: But with that I wouldn't go for anything too fancy. I wouldn't look as if you've wasted money on it if you know what I mean.

Male 1: Yes.

Male 2: You know those chequebooks that HR did about getting people. To me that was just frankly a waste of money. I don't know it just… I'd been [?? 0:54:15] to have something very practical, I don't know. But anyway. I'm not the artist as we know, I'm not the artistic, creative one.

Male 1: In some ways it needs to tie into blue and gold [?? 0:54:26] as well.

Male 2: Yes.

Male 1: Within that tool kit that they take away there needs to be some sort of link. I'm not saying it needs to be the gold [?? 0:54:32] but get something. You know [?? 0:54:35] it may be the ladder of loyalty I think we've got zero to five, right?

Male 3: I can see [?? 0:54:43], yes. So the whole [?? 0:54:53] how we communicate and won't forget [?? 0:54:56] and Neil.

Male 4: I think Mark you're right is you don't want to look as if you've just spent a load of time producing loads of stuff for this but it does want to be…

Male 2: Yes.

Male 4: What's there needs to just be sharp and to the point but also professional so these guys are known.

Male 3: Yes it'll have to be world class, it's go to be world class. Last time we had huge criticism about we talk about world class it was simply a shit presentation.

Male 4: But okay but I think…

Male 1: It's funny but I think Sales have that representation.

Male 4: What?

Male 1: You're meant to be judged, you're mean to be like the extroverts and the ones that spend all the money but…

Male 3: But we don't.

Male 1: Yes we're not.

Male 4: Certainly spent enough time [?? 0:55:36].

Male 1: Alright.

Male 2: Okay.

Male 4: Okay.

Male 2: [?? 0:55:40].

Male 3: Yes once I'm clear with Andy. Andy [?? 0:55:45] speak to me about this so I'll go and do that.

Male 4: So the other caveat which I haven't mentioned but we did talk about this is the kick off proximity because…

Male 1: Good point.

Male 4: Do we…if we're a few days around it I'm just worried things work to cancel each other out. That's my worry. It may not be true but that's what I'm concerned about.

Male 3: I'm concerned about it but I think nothing done here undermines kick off.

Male 4: No. But I would almost say that kick off, the goodwill created at the kick off event should be leveraged for this rather than put this in and then experience kick off. That's just the way…

Male 1: Is this before the kick off?

Male 4: Yes at the moment it is.

Male 3: [Cross talking 0:56:24] two days before the [?? 0:56:26].

Male 4: At the moment it is.

Male 1: The kick offs on a Thursday.

Male 5: Then may be what happens is that this is so focussed and so specific and doesn't try and cover everything that it focuses more on the message of the Sales Team than message for the Account Team. And may be have only one external speaker that ties it up at the end or whatever. And then do the activity so it is more just like a group, you know a group message, a group thing. And it doesn't take on this large [?? 0:56:55] bring in the kitchen sink message type attitude. Because there in fact in a couple of days you're going to receive a much larger message that is going to be much more applicable about the Mission of the company.

Male 3: Yes, okay. So it's your job to have things actioned and to make sure that none of that happens. Get involved in the kick off as well.

Male 5: Yes.

Male 3: So if you're worried about that, just [?? 0:57:16]. I have spoken to Nigel about this type of [?? 0:57:21]. We don't want to take it away but this [?? 0:57:25] on it and then it's a subset of people who've been to the [?? 0:57:29] event already.

Male 4: I just wonder if it's worthwhile putting it a week after kick off, that's my…

Male 1: One of the reasons why we do it is travel and logistically people coming in.

Male 4: Okay well…

Male 1: It's literally two days.

Male 4: Well that's set, right. Right so we just need to make it right.

Male 1: Over a weekend.

Male 4: Yes okay, okay. Let's just do it. Right I've got to get back over.

Male 3: Book the venue.

Male 1: Catherine.

Male 3: Catherine's on that. So she's been to the place it's actually all of it is already booked. We just know you guys are going to love it.

Male 1: Confirmed, venue.

Male 2: Just make sure we can fit enough people.

Male 3: You can. Only thing is do you guys want to stay for dinner after all of this?

Male 5: If you do bowling then you should have snacks within the bowling alley.

Male 1: Yes. I don't want a sit down dinner.

Male 2: No.

Male 1: Personally.

Male 2: It's a bit tight our format. I think bowling plus snacks is great.

Male 3: Great. So we're not going to go the Rowland Restaurant in the same hotel, good.

Male 5: Revenue saving.

Male 1: Personally, I don't know that's just my view.

Male 3: There's a variety of snacks and food in the bowling alley and there's also a separate Tapas Bar. So we can do, we either have food and mingle. So we can do…

Male 1: That's my mingle opportunity.

Male 3: Yes exactly. Shall we just have food and drinks in the bowling alley and that's it. And we have it quite earlyish…

Male 2: Tapas is also quite cool.

Male 1: Tapas is so European.

Male 3: Do you want to speak to Catherine she's really good. She's good with food.

Male 1: Yes well I'd really like us to try and prevent that sitting down on those tables and then things will get… I'd like to try and get up and move around. Somehow even if it's tapas. Anything like a food station you

just go around each food station – do you know what I mean? Stand up rather than sit down.

Male 2: Yes stand up on a plate, buffet. Help yourself to tapas.

Male 1: Yes.

Male 3: So that's the Tapas place called Carmen.

Male 1: [?? 00:59:21] and off we go. A couple of drinks.

Male 5: Alright.

Male 3: Bowling alley is…

Male 1: Alright do you want to just tell [?? 0:59:33] cool though.

Male 3: The tapas place is very cool.

Male 1: Yes something like that.

Male 3: Here's the bowling place.

Male 1: So it's not a formal table.

Male 5: Are there any other actions that we need to…?

Male 3: That's what the bowling alley looks like.

Male 5: Address.

Male 4: No I've got mine – invite the delegates is that your…?

Male 1: It's only full length.

Male 2: Catherine will do it.

Male 4: Guest speaker.

Male 5: You guys need to coordinate that who you want and what message you want to them to convey.

Male 3: The practical question [?? 1:00:01] bowling alley is binned off?

Male 1: Let's have four lanes, that's 24 people.

Male 3: It doesn't have to be a problem because you could play one frame and then swap.

Male 1: In some respects…

Male 3: It's just more coordination to do that.

Male 2: Yes you could.

Male 3: In some respects…?

Male 1: Yes you could [?? 1:00:20] something.

Male 5: Tied.

Male 1: Well I'll have a chat about that.

Male 4: Alright guys sorry [cross talking 1:00:26].

Male 2: Guest speaker? You'll action it.

Male 3: Speak to me and I can…

Male 4: I'll talk to Patty.

Male 2: Patty yes.

Male 4: Because she [?? 1:00:39].

Male 3: Invite delegates.

Male 4: Right guys I'll see you later.

Male 1: [Cross talking 1:00:44].

Male 2: Alright.

Male 3: Thanks a lot Gareth.

Male 4: No problem.

Male 1: Could she send over the list and check. It shouldn't be 'You're invited' it's 'Please reserve this date'.

Male 3: That's something you can work on to make a list.

Male 5: Save the date.

Male 3: Make a list of the people who should go in the Accounting document [?? 1:01:14] everybody on the Accounting list is…

Male 1: Yes, make sure it's the latest one with the Software Engineering [?? 1:01:22] added.

Male 5: If it's anything like the SPE.

Male 3: No it's not it's just a [?? 1:01:26].

Male 1: I will have a look at that.

Male 3: So you work with these two gentlemen and make sure the list is correct.

Male 1: Yes okay.

Male 3: And you guys must [cross talking 1:01:33].

Male 1: Because there was a question mark we had about what about the other VPs who we invite.

Male 3: What do you think?

Male 1: I think it's… One I think we should create a bit of competition, we get into the Account Teams but I think it's a club that everyone needs to see. It can't be an exclusive club where people… Otherwise people [?? 1:01:55]. So I'm not going to support it yes so you didn't invite me so what's my resource going to do.

Male 3: So we get them in?

Male 1: Yes.

Male 5: And you create a want, they want to be in. How do you create that want? Something unachievable or something intangible.

Male 1: Put all the people that aren't in the Account Team on their own bowling…

Male 5: You're reinforcing a negative stigma.

Male 1: I'm joking.

Male 3: They'll get the fourth one.

Male 1: They don't get to play.

Male 5 And now Toppers. They get to watch through a video feed.

Male 3: They [cross talking 1:02:27] and they get no toys.

Male 1: And they're not allowed tapas either.

Male 2: Cool. Okay I'm late for another meeting.

Male 1: I think we're done Steve.

Male 3: Thanks gentlemen.

Male 1: Thank you.

Male 2: Sorry I've infected everyone.

Male 3: So you're going to speak to Pat he'll find a speaker.

Male 1: Yes.

Male 3: You're going to work with Gareth to define the [?? 1:02:51]. Kevin can you do me a favour and just write this up.

Male 5: Yes, yes sure can do.

Male 3: I'll give it a once over after [cross talking 1:03:00].

Male 1: You okay?

Male 5: Yes I'm great. There are lots of things that I wanted to say.

Male 1: Creative juices flowing and…

Male 5: Yes. It's alright you kept kicking me under the table.

END AUDIO

Symbian focused interview

Interview Transcript 19.02.08 14:06

K: There is a bit of a difference between what she has been asking and what she has been wanting. What she specifically wanted to some degree is just the marketing plans, just I mean as basic as possible and some collateral to back it up to see and to measure and so on and so forth.

Yeah okay. So apart from what I have told you about... I could give you a bit more... if you are interested in what we were finishing talking about was saying how this structure works because [??]I'll help you if you want to know. I'll just give you a bit about a modem and how it works and why it's difficult. But alright, there is some other stuff and the problem is, we've moved so many times and there's so little storage space. I am not sure if I have got it. So 2004 we did.... wait a second, wait a second, go back to 2001/ 2. (interruption). Okay, so 2001, we did the ... we also did ? for a brochure which I rewrote. That was along with um, ... I don't know if I am going to be able to find this. That was called The White Book.

K: Okay, but... I? must have the White Book then.

I should probably have an old version of it, yeah. It's 2001/2002 and the White Book was the main piece of corporate collateral.

K: Okay. Who was the audience?

Um ,everyone. It was the kind of business [???].

K: Okay. And was it... I mean, did you find it to be successful or was it kind of...?

Well, it was successful in the sense that it ran for several years before it was superseded. And ? was the thing that superseded it really.

K: Okay.

So yeah, it probably ran from 2002 to what 2007. Something like that. so yes it was successful ? various iterations. But you know, it kind of told you that this is Symbian, the basics. And there was the first corporate... we did the first corporate brochure, again which I have probably got a PDF of somewhere, in about 2004, that I wrote for David Levin. And that was more higher level... that was more sort of, this is the corporate thing, so it was more of an aspirational type brochure, a gentler... if you know what I mean. So the White Book was very much a kind of ... it was a list and a technical , a slightly technical description of Symbian and Symbian products, whereas the new corporate brochure was a much ... a lighter weight, less text, more generic introduction to Symbian and its aspirations. Again, ? success ? it was printed once and wasn't done again. And the reason for that was... you see it's an implementation issue, it was too ... I mean, you know corporate brochures need to be very generic so they have a long shelf life and unfortunately committee writing, being what it is, it was far too specific about things and went out of date far too quickly. So it had quite short life span really. But, you know, it seemed to go down quite well at the time. We had no measures... so again ? should

probably have somewhere I would think. What else?

K: Overall, what were some of the... some of the objectives were communicating with the shareholders, with the developers and just within Symbian. Is that correct? Is that one of the objectives or core ideas behind a lot of the communications that were developed?

Yes, pretty much, so you need to look at it... there has been a gradual change in focus in the last year or so really. Marketing originally use to focus on kind of corporate promotion, so Symbian as a company is a ? system sort of thing, and didn't concentrate on the development? As such, so it's core customers, the developers, were really not catered for. That was not through sales. It was done on an account basis. So we completely missed that point for a long time. So yeah, I think that's an important context because it kind of ... you know, there's a limit to what you can do in promotion and promotional campaigns, being what they are, it's you know... it's just about positioning. There was ... so a lot of what.... there was a lot of... you should put this down. 2004/5, a lot of rounds with analysts. That was part of the reason for the corporate brochure. Maybe 2004 would be about right. And that was city analysts, ? it was or it wasn't. That was David Levin and Thomas Chambers did that. And again, by producing a lot of collateral to back that up, so that was – again that was dealt with by the PR team, so you need to check with - Papas should know about that. She was there, and it was the PR team who set those events up. I was merely providing collateral for them.

K: This may seem redundant, but it's going to be asked from a different perspective. One of the things that I'm looking at are, some of the – from your perspective, when you were looking at some of the ways that you thought best to communicate however as a goal for Symbian, some of the markers that I've used in looking at them have to do with whether they were collaborative, or individual, whether the, I mean really what is the inclination of some of these solutions that you think of, because a lot of them seem to be shots in the dark with a business orientation to a goal that may or may not be proven. I mean, so as I've listened to you talk and I've listened to a lot of other people it's not as though the events that are surrounding the ideas that you have were intuitive, even to that degree they were more ... 'there is something that we need to be doing, there's information out there that's telling us that we're not necessarily doing it correctly, but along a timeline those things are changing, so it seems more like a party game of catch-up. I'm just trying to get my head round this because...

I think you're exactly right. You're exactly right. A lot of this is reactive, and kind of – it tends to be reactive because of the politics of the situation rather than the market dynamics of the situation. That's very true, and that's an observation I've had for a long time, that it's partly to do – because of the strange structure of the company, that the people who put the boot in are sitting on the supervisory board, and then of course that cascades down and – then it's a question of – it's classic marketing, right. So the supervisory board says it wants something, and that want is translated literally rather than the need being understood and the marketing team reacting in the correct way necessarily.

K: Okay. Do you find – do you feel that what you feel, instinctively, comes through in the communications or do you feel as though you're translating. You get guidance from above and...

Okay – okay. Yes, I think that's generally the case – that there is – this is a um, it's a classic case of a manufacturing company, and manufacturing companies, okay, it's not only us, Psion was a manufacturer of ? PDAs to the software and the hardware, right. And so is Nokia, so is Sony Ericsson. And you're moving into a world that Microsoft has shown the way to go, right. They're a software company, and they sell software but they package it properly, they have ???the customer as their developer. And that's not been the case with

manufacturing companies going through monumental changes, in moving from being, you know, consumer electronics brands to software and services brands, and still with consumer electronics involved obviously, in Nokia, but also big, big changes in the software services side.

K: Now, do you feel, generically speaking, regardless of whether it's the software company or another company, the ability to keep, maintain or establish um, an intuitive aspect in the way you're coming up with ideas, with the needs – is there kind of a meeting of the minds where your intuition is taken into consideration, on a par with what's come down – or is that more of a level or position that's more important than it is the actual idea? You come up with a brilliant idea, it may ??? with what they decided, the new direction to go into, do they meet on a level playing field or is it taking into consideration to the – is there a negotiation around it? And the reason why I ask that is because, by the nature of having a company that's dependent on either viral or grassroots or anything like that, innovation can happen, has to happen at the bottom level. Hierarchical structures don't enable creativity or innovation in that way. It's almost a reversal which is, you know, you did have the dot com boom, but although, logistically not rich, or practically rich, conceptually and innovatively it is. So it's kind of interesting to – I'd like to get your take on that negotiation, between the ideas that you have from this level, with the direction that you ??

Yeah, well, as I say I think there's – my background's marketing, right, so I'm pure marketing. So – and I think that's, you know, not everybody in marketing, in fact a large majority of marketing is not marketing, they're not marketing-trained, they're engineers, or, so I think there's necessarily you have to filter out what senior management want into what is actually required, needed. That's what you're asking.

K: To a degree it's more symptomatic. It's kind of either a design or marketing role, sifting through what they're saying, to they're really needing.

Yeah. That's classic, right. You have to do that anyway, with any – you know, your customer at that point is your boss, saying I need – I want this, fine, how's that fit into what I'm doing and what is actually needed, ...

K: But there's an irony when it misses the mark, because then neither of you are really happy because it's not really the need that you see, and then it's not the way that they thought they would see it . And I'm talking purely from a visual what's in my head type thing.

Yes, indeed.

K: Okay. That's essentially the negotiation I'm talking about for my PhD, so it's interesting...

Aha, yeah, yeah. I would – my solution on this is that it's to do with – you can have market or you can have industry knowledge, but that doesn't necessarily give you the um, the actual job skills, necessarily, to – so, from my point of view, right, I have a specialism in understanding information, marcomms, communications, that's why I'm product managing at the moment, I'm dealing with this kind of very core part of the business, so this is something I always deal with. I've always been writing for audiences, understanding what do they see – understanding the media communicating it, why you're communicating with that media, how long will it last, lead times in, you know, um, the life cycle of the products, and the impact of those products, how you follow them up, um, now not necessarily, so for example if your CFO comes to you and says right, I want to do a publication on X, you're going to say okay, fine, all right, you're a CFO and you're financing this, that's good, but yes, I'll have to translate some of your requirements into things that will actually work in the outside world.

K: When you're doing that, when you're listing all the things that enable you to do your job, where ?in line does it come with an instinct that you're not exactly able to do um, to explain, where you just kind of come up with an idea, and some of these things...

Sort of thin slicing?

K: To a degree, yes. Thin slicing, based on the experience that you have. Now I would almost believe that the CFO would have, when he comes to you, more of a eureka moment, when he thinks that a good idea will work, as opposed to slicing, because that's not his speciality, and it seems like the difference between his eureka moment and your thin slicing, it's interesting.

Yes. It is interesting. [laughs] How would you put that – you would say the eureka moment is, they've obviously identified a requirement to communicate generally, because we're talking about marketing mark-ons, and that eureka moment is, um –

K: So it would be hard for you to maintain as being your professional and you're deriving what would work, based on what you ?know?

Say that again?

K: When I come to you not knowing what you do or how you do it, and I'm just saying I have a great idea, I just like – you know on my way to work and I'm like I want to do this. And when I communicate it to you, it's almost as though your position is to thin-slice that and make it into a tangible and, or a return on investment and all these other things. But somewhere in there, when you're coming up with a solution, you're having your moment as well, and it's not um ..???.. it's not just about thin slicing, because even though you're experiencing forms your decision, there are times that you may go into a critique, or however you want to call it, feedback, and the idea that you had, you're going to justify it. It's almost as though an artist makes a piece of work, and based on his god, or based on what they envision, and then goes into a – goes into a critique where they say well, my influences are such and such and this is how I'm justifying the work, when in some reality, some of that can never b justified, it's only a post – mortem of that, and even though your percentage of thin slicing is probably ninety ten, it's that 10% that you're accessing that you're still excited about, that you want to do it, that actually is the part that inspires you to do the job or come up with solutions. The most knowledgeable person about painting may not be able to paint shit. But a person who does not have that ability, does not know why they do it, still could produce a piece of work that could be sold for a high amount. So ... and I don't' expect that you'll be able to access and disseminate a level of thin slicing what you're excited about, but I would say that at least on the level that you are excited, you might be able to relate more on the level that they're excited, and bring some context into where they're actually coming from, as opposed to thin slicing.

Sure. So, all right, here's um. You've rung a bell. So we did a campaign called Symbian Smartphones with dummies. Date -2005, at the best guess. Symbian Smartphones for Dummies obviously was the 'for dummies' brand, obviously, who doesn't write . It's obviously customer publishing.

K: Yes, I've seen the book, it's on –

Yeah. So that was my baby, written by me, Fred and Phil, actually. I did that for David Levitt, who was quite chummy with Charles Dunstan at the time, so David said ??? these Dummies books, I said all right, yeah, okay, so. You can do a Dummies book, what are we going to do with it, right? We'll print 100,000 copies of these thing, which we probably did. Was it 100,000? It was a hell of a lot of copies, anyway, and said okay, we'll work with Carphone Warehouse to distribute them through Carphone Warehouse. Now, at this point, I was saying, give it away for free, you lose – you instantly lose any way of measuring it, because it's free, Dummies brand is strong, it'll just fly out the door, you'll never see it again, you'll never know what effect it had. So don't do that, price it, make it £9.99, do a deal with Carphone Warehouse to sell it with boxes of phones. That of course is a good idea in principle and practice, hard because you've got to work with – you've got to pay Carphone Warehouse and you've got to get them to agree to box it in the warehouse and all the rest of it, work out how they're going to price it at the till, you know, there are a number of additional issues at the retail side there, plus remembering that of course Carphone Warehouse are box-shifters. They don't give a – ultimately, those guys at Carphone Warehouse are not great salesmen, but they just want to sell a ?? phone every 45 seconds, I think is the rule, so they don't give a damn about the book, if it helps them sell it, yeah, fine, just – so you're not going to have any sales help for that. So we went through this and so on, and I pitched up and said look, we can do this, but it will cost us, because Carphone Warehouse are not going to just give it away for free, right, they're going to want us to – it's a promotion for Symbian here, but that didn't work. So the initial idea of Smartphones for Dummies, great, but in practice it went to a free at a little book fair, and it was a free giveaway. And I think we gave 30,000 or something, 30 or 50, it was a lot, to Carphone Warehouse that went in a weekend, in about 5 branches in London, they just went whoosh! And gone. But, so there's an example of perhaps what you're after, where you're saying it's a good idea in principle, in practice if we don't do certain things, for sure we can test the ?ROI in some way, how many Symbian phones did this sell, or sold with the Smartphone s book, then we've really just spent 30, 40 grand on paper. Or, at best, relationship building for Carphone Warehouse.

K: Yeah, but it depends on the events, and the environment in which you were cultivating the idea, so you understand what were the things that you were aiming for - I'm going to have to cut this short because I still have to get a press release out. Are you around all day today?

Yeah, I've a meeting at 2 but I'm around all day.

K: Okay. This has been the best conversation I've had so far, so I really appreciate it and I would like to get maybe 10 more minutes with you just to cover ...

Well, you know where to find me.

I don't know enough about Macs. I am quite recently to this.

K: No. But it's saying no signal.

That's the thing that is bizarre. Maybe we should just forget this and just do it off the laptop.

K: Okay.

It's easier. I don't really know why it's doing all this stuff.....no. Now what's it doing? Is that just you? Maybe it's building ??

K: No it's ?? Okay.

Hello.

K: Hi.

Sorry it's a bit of a Wednesday morning start. Tell me a little bit about you. Or you can tell me a little bit about you when we go through this.

K: No that's a really good point. I probably should start..

I'll tell you a little bit about me. Okay, so what do you want to know?

K: Oh my god. That's like an infinite amount of questions, so I'll start with me and we can narrow it down. Let me see. My name is Kevin. That's a good start. I am doing a PhD at Goldsmiths and I have been working at Symbian since October on various roles but I worked into a design position there. And ...

I don't really know what Symbian do either.

K: Oh right. Symbian, actually if I give an example, that's probably the best way. I have a tendency to walk around with [???].

Whatever make you comfy so..

K: Okay. So Symbian make software that run phones. So they actually make the operating system. So they're a

software company as it were. And they're theoretically an open source company so they make smart phones. Smart phones are supposed to be phones that you can build applications for and, you have some kind of user interaction with them, as opposed to a closed phone would be like an iphone. You kind of buy it and you get it out of the box and any additional software that you want on it you have to go through Apple pretty much. But with smart phones there are other developers that are making applications for them that you can download.

So what sort of phones?

The software is licensed by different people. Nokia is their main licensee. Motorola is another one. Motorola, Samsung, Sony Erikson, LG, ? so they've got somewhere between 60 and 70% of the smart phone market. Yeah, they just celebrated 100 million phones being sold with their operating system in it. And in Japan alone they are the largest operating system, so it's like 30 million phones there alone. They don't have a big market presence in the US. And I think their last [???] were the N95 and the N81. That was just in December. They've released phones since then so yeah, they're pretty... it's pretty... it's probably the least straightforward organisation that I have worked with, only because they don't by themselves stand alone. So it's not as if they put their software in store. So because they work off licensees it's almost like a two tier. What's most important is actually the phone and then they work with the licensees to make the software important and developers. So their audience is quite a bit... I think their audience is quite different and because of that I think it's probably a little more political and at times a little less innovative. But by nature of it being more an open source it needs to be innovative because you have other developers working on it and they want to see it do different things. So there's a bit of push and pull there, probably more so than with a straight to market item such as like Microsoft software or whatever else. There's an issue there that they just buy the company and the name to [???]. whatever else. It's very um, as far as like ideas and flow of ideas and seeing how they kind of come about, it seems like it's a lot... there are a lot more issues from within the company. If you're a developer I think it's probably a lot easier because you're simply developing things that you want to see so it's different.

Lots of different input from different people..

K: Yeah I think so. But I think it's .... I think it's... I think there's a difference between innovative input and strategic input and I think the strategic input is, as usual, held by people within their hierarchy, their licensees. But I also think that some of their [???] so um, not Mitsubishi, Motorola may want to see a functionality for their phone that Symbian will build in. But that's not necessarily innovation on Symbian's part, the ones who are actually making the operating system. So I think that the developers are probably the only ones who have quite a licence to dream as it were. So that's... I mean that's interesting. It isn't really... there isn't that aspect of it that I actually really get into because um, since I have been there I have been doing case studies. Well, I have been doing [???]. it's turned into a case study or my case study. And I have been interviewing people to see....it's kind of changed because initially when I started the programme I did it because I was interested in patterns, and at the time I was interested in ? theory, quantum mechanics and fractals, and these type of things. So when I had ? my design process, like an ideation, research and development, production and so on and so forth, I saw it as kind of an iterative process. So where exactly do you get... you know, how do new ideas emerge from this process that seems to be so predictable in a sense? And that's when I kind of came across fractals and ? where you end up really being dependent on the emerging value, the unpredictable and so on and so forth. And I was thinking that maybe I was making pretty strong associations between ? theory and the design process. In ? theory you have things that affect systems, constraint detractors, which means that if we just draw like a figure of eight, it'll never intersect in the same place but just by this ... by ? it's being affected by something that makes it cross in the square and that would be a strain detractor. And so I thought that there might be strain detractors within the design process. There might be reasons why we go to one thing instead of another and why some of these things have commonalities. And I saw that because I felt design as a whole kind of plateaus and by that I mean um, there are certain things that can be found in nature that we haven't really come close to as far as like

perfecting. Like water, water is an amazing and natural phenomenon but some of the designs that we have, the phone and ? they never really come close, I mean either because of waste or energy of these things, or reusability. Um, it's not necessary cradle to cradle design. It's much more like a cradle to grave. And so I guess I was thinking about it along those terms and the amount of technology that we're using in order to make things better and then some of the things that are naturally quite good and [???] themselves. So before I digress too much, it kind of... it moved on to something a little less existential, something that I could (laughing) exactly.

Existential is fine at this time on a Wednesday morning.

K: I pick up old ? it's great. No, but my supervisors were losing their hair and so I tried to make it something tangible. So it's interesting that I didn't... sustainability. Because all these things happen to do with waste and consumption and how our ideas actually end up turning into something. And that was the part that I was most interested in. Kind of, the transformative function of, I think of this and all of a sudden it becomes something. And um, and they were like, yeah, that's neat too but we still need one thing. So that's kind of what this presentation is about is that that one thing. And what it is is it's kind of ? terminology between a Eureka moment and then thin slicing. So thin slicing by the designer and a Eureka moment by the client. How do you reconcile the communication gap? So if I come in with you and we start having a conversation and you kind of know design and I don't and all I know is that I have envisioned this brilliant idea, how does the communication go? Because what I have experienced at Symbian and even when I do design consultancy is that um, it's kind of a problem, an iterative problem solving process, where um, we pick out things that we think are important and sometimes we'll elicit more information. But by and large the designer does have at least a mental routine that they go through and an approach that they do. And so what it can do is narrow down some of the ideas and actually ? some of the connections that you might make with what's most important to the client, which is that thing that they're decided about. There will always be the transfer move, the process of taking that idea and making it into ?? or whatever any of these other outputs, but I am really focused in on when you actually communicate the idea.

Okay. I suspect you'll find that what we do is very very different to the sort of thing that you're talking about though. Because we do nearly all FMCG work. We have to work... we tend to work within limitations and parameters a lot which can be in place before you've even started down the design ideation sort of thing. So that has its own set of rules and regulations that you kind of have to work with. So it's quite interesting. Because if they start with a, well, we can't change the colour, do this or change the shape, so where do we go to next? And you're often working within that sort of framework anyway.

K: Yeah.

It might be slightly different to... because software being a little more, a little less sort of tangible in you know, as in it's not a solid physical object, I suspect the issues that you come up against in terms of development, how an idea sort of grows, you know organically from where you start out and where you end up, is quite different to the process we have to go through. And there's sort of check lists and stuff that we have as well on the table.

K: I'd be interested in the check list, but in addition to that, working in the market of communications, most of the ? that we've had or that I come across are quite tangible in that um, they're collateral. Someone comes in with an idea about either a market, a market campaign that they'd like to run or even um, a new ? that they'd like to see or you know, some kind of web design or actually um, there is a timeline that I have been working on for the 10 year anniversary. There were 2 people and a couple of meetings. The first meeting, um, I was working for the BPF sales and we sat down with someone from the market communications department when I wasn't

working there. And what ? was most excited about was something that kind of um, was a chronicle of all the phones. There was something very exciting ? and he wanted to communicate this. And the other person that was in the meeting from market communications um, took a different approach. He immediately saw what it could be and um, there was like a 10 minute conversation between the two where I could distinctly hear one person's idea and the other person's idea. And they weren't matching. It was one person's ability to disseminate the information into a deliverable and the other person's basic, just excitement over an idea. And they kept... and it wasn't fitting so it ended up being um, Andre kind of relinquishing and saying, well you know, you're the designer. You know, I think you understand what I am saying. You know, just go ahead and do whatever with it. And I could see the other person going yeah, yeah, you know, I told you there's a whole bunch of options with this. And I saw, it wasn't necessarily like both of them walking away saying, oh my gosh, this is you know, he gets it and you know, we're going to walk away and we're going to come away with something great. It was more like, okay, well, you know... I am not exactly hearing what I think I should be ? understand. But he is a professional so on a so forth. So even with things like a timeline or a marketing campaign there is still ... it's still kind of the approach of the idea. And when someone comes to you with an idea how exactly do you handle it? And what ideas are you considering in the solution? How are you able to um, meet their excitement or their kind of inspiration? How can you be kind of self-aware over your own ability to kind of incense and take it through your own experiences?

... a bit dead by now. My machine just kind of closes down.

K: How do you ?

Yeah I do. It's quite big but that is nice to work from and .... there we go. I don't know why that is suddenly ...

K: It should be ?

Fantastic.

K: So the title of talk is, ' How can designers move in? and thin slicing and Eureka moment communication ??? So why thin slicing and Eureka?

You talk about thin slicing as ? detailing.

K: Well, thin slicing is actually the ability of our unconscious to find patterns in the situation based on slices of experience. So um, one example is for ... there was an example in the book that someone came in with a piece of work, a piece of ?sculpture that they had found and said, you know, I have found this. It's really old. Is it worth anything? They're like, oh my god. It's one of the lost pieces of whatever. And um, one of the curators came in and was like, I don't know about this but truth be told he wasn't sure why he felt that way. But I mean if he sat down, it's because of all of his experience with ? he knows that certain things don't fit when he is taking a look at it. That would be thin slicing, or a teacher or a designer who has been doing it for a while comes in and looks at a piece of collateral and says, okay, no. And the initial judgement is thin slicing. And it's based on all those years of experience and after some kind of conceptual conversation they'll go through and say, this isn't right. This isn't right and so on and so forth. A Eureka moment in contrast being a? Step, basically is kind of like, you know, you get it. It's like...it's stepping out of the shower, sitting in the bathtub, all of a sudden you ? Typically it's problem related though. It's typically something that's been bothering you that your sub-

conscience is working on.

Yeah we call that pivotal point sort of thing. Because quite often from the work that we do you'll end up discovering that there is one specific thing or maybe two or something. It depends on the shape. But I tend to think, I am ex-quantitative researcher as well so I think numbers as well as sort of ... I think of it in shapes. But ... so my model... you can have a model of thinking where actually everything stems from its triangular kind of relationship. Or there's just one point from which everything else radiates. Or if you haven't got these three things nailed you can never resolve the rest of the stuff. Those tend to be our Eureka moments. It's all about the pivotal point and understanding how everything that you've learnt fits together in order to create the argument. But literally ... you do tend to sort of do, well okay it's like this because you've got these three things here, here and here. And if they're not all working or maybe it's a balancing act or something, you know. You have all this sort of ridiculous, you know, put the scales on, or... I did an entire debriefing around a lighthouse analogy once and how...

K: That's cool.

Yeah. Because it sort of worked. It was like, how much light was shining. And adding the rough seas and the cholesterol. It was all a bit ridiculous. But you know, whatever it takes to get it across, that's....

K: So um, what I am hoping to do is provide an intervention between the communication gap between the two. So when you're specifically in instances when the client is having a Eureka moment, not only to be able to recognise it, but to also provide a positive intervention. So it's something, almost like... one step would be a bit of self-awareness. Um, hopefully what I am developing is a tool so the tool would be... would handle some of the predictive nature of the design process where.... the research that I did initially started at, what is the idea? And then it went through, part of the predictive nature that we have with ideas, like you have one plus two won't always equal three. Um, then it goes through the probability, you know, if we do this then these are probably the outcomes that will happen because of it. And then um, the productivity of, actually looking and providing an intervention so you could be proactive in your assessment of what the actual problem is or what your Eureka moment is.

Okay, can you share your economics? Um, with some of the timelines that I have had with Symbian, um, and looking at your economics within the ideation process, when you're sharing ideas. So the individual versus shared moments and collaborative versus individual, um, what I did on their timeline and looking at their marketing campaigns was um, with these individual campaigns was just one person's economic. Oh, I have this great idea or is it collaborative? And then what were the impacts? Were they high or low? And long term impacts. And that's just to try and... it's not going to be um, it's not going to be telling of obviously all experiences, but it does give me a general idea. And then you have personal and professional. There was a really funny conversation that I had with one of the senior management, and even though she's the head of a department, she was saying what she really felt personally and what her passion was behind. It was coffee. And she was saying that, you know, I am in the wrong business. I could totally be selling coffee because I know everything about it. I love the smell of it and all those sort of things. So it kind of made me wonder about, when people have Eureka moments, they're not always the people that are involved in the situation, the job that they're in. And it sometimes becomes that much more important as these are things that they're actually really passionate about and they actually think about, not in a problem solving sense but just as opportunities. And when a designer comes in touch with that, what exactly is it that they're touching on from the personal and the professional? And I just wanted to... I am going to try and iterate some of the kind of the difference between the two, because I think it's kind of important. There's my boss said that we have this directive. And actually this came out in an interview that I did a couple of days ago where um, the guy was telling me that um, it was kind of a hierarchical mandate from above that they do some kind of campaign. And I was like, well, how does that meet with your intuition of what you really like is a good idea? And I said, how is that taken into consideration?

And he was like, it's actually not, but it's... for me it's again that conversation between what someone would be interested in and excited about and what someone's thinking and talking ? consciously about a situation and how to go about a solution. I think that the communication gap can probably be alleviated at least some way up to where the solution may be coming out a little bit better.

Thinking about this though, when you share Eureka moments, it's funny ... so from what I did here it's less of a ... this is more my experience than working in other agencies, particularly working in a design agency or... kind of quite broad but mostly FMCG but also some other stuff, and I think the key thing is that the Eureka moments would not be shared with the client until they'd gone through two or three rounds of internal assessment with a lot of different people. You know, so the designers just go off and just go bananas, you know, and indulge their passions, and you know, no holds barred. It totally depends on the project, but if you've got a really nice [???] and people doing a piece of work, how do we sort of fix this, or kind of come up with what you want to. You would go through several sessions internally before you even started thinking about taking anything to the client. So you might spend 3 weeks, 3 or 4 weeks just generating ideas and [???] them, shaping them, crafting them, and then you know, one of the projects that I had, we had 26 different, completely different routes we could have gone. You know, they're not even just general like slight tweaks on [???]. they're completely different things on the table. And we got those down to 4. But you have to go through that process of assessing them as your proactive bit basically. And you do that by creating as sort of like, so what are we trying to achieve here and what is the [???] and what and why. And some of it is just personally, I just don't like that, you know, sometimes. So just, it's not ringing any bells for me. I am not excited about that one so you just get it off the table. So you know, it's quite interesting when you're sort of thinking about when is the best time to talk about it, because by... I think if you're talking about the lack of communication between the designer and the end client, by the time, if you've gone through that process and you've kind of got the idea so beautifully shaped, you know, obviously with room to manoeuvre because it's never going to be the finished product. But by that point you'll be talking more on the client's terms, I think. And also design agencies as well, you always have somebody who sits in between the designer and the client, always, always, to sort of make that translation.

K: So it's actually the third person who actually kind of develops the conversation between the two, between the idea and what they're interested in. Or is it more of a negotiator of, I mean, do they sit objectively between the two or do they sit in order to translate, you know, the language between ...

It's a bit of both actually. I think there's the objectivity thing which I was just sort of writing down this whole, you know, the passion of problem solving, I have actually found that sometimes the more objective you are, and that's a role that we do play quite often as researchers. You hear the client saying one thing. This is what they need. And you've got the design agency who is the same but you know, from our experience this is really exciting and this picks up on all these trends. And they're going, yes, but we just want to make it more blue, you know, and try and sort of mediate between that being sort of a more objective observer, so you actually say, we can hear what you're basically saying but this is where they meet and we haven't heard that bit yet. And they'll be like, oh, you know, and that's sort of the role that you can play. And sometimes it's better not to be too passionately involved because otherwise it makes it quite hard to be...if you become too subjective about the subject really.

K: No, one of the Eureka moments is actually the client's, with their emotional ... what their emotional stake is, or what their passion is, or what their core message is. And that doesn't always come through... one issue is that that doesn't always comes through the design brief and that sometimes whoever is having the conversation didn't actually make up the design brief. So um, it does make it, you know, this wouldn't work for say ?Tika or Tesco or um, Sainsburys, as you know, this design brief has gone through however many iterations to come down to what exactly is it they want. And actually I have a friend, ? and she ... she was at Apple as well and she

has told me about briefs that she has given to designers and then said, okay, you didn't read the brief. This isn't what we want and so on and so forth. So asking her for an emotional response is not a good idea. She's a bit of a ???. She's an absolutely wonderful woman and I love her to bits. But professionally she just eats people up. So um,

Well, mind you, unfortunately there is a role for that. It's not, you know... and having been working as a planner at this agency there were a couple of times I should have actually turned round and said, you know, that's crap. Go back and start again. Because you know, there was a bit of work that they didn't really get, ? on the basis it's a very small amount of money. We'll just bung it, someone can do it part time. And actually if one person, or two people had just spent a bit more time really thinking about it it could have easily been a very good piece of work rather than a sort of half-hearted ?

K: I think there's probably... from ? that you're talking about with um, the iterations that you need to do in order to formulate the idea, um, into presentation or at least something presentable to the client, um, even before ? it's an internal brainstorming um, I am wondering about whether... I think that sometimes once that idea, once you get you know, down to 26, and ideation is almost ... an ideation per say is almost over because you've got the ideas on the table and these are the ones that you can develop further into a solution that you're going to present to the client. The way that I have defined ideation, that would almost be the tail end and so these should be Eureka moments but actually a Eureka moment is more like... what almost happened at the very beginning when they are communicating the idea to you, not necessarily when you go back and have your ideation. And I think part of that is because it's very complicated to um,... when it's dealing specifically with the client and the communication with them I try and take into consideration what actually um, how do they reach the kind of consensus where both of them walk away quite happy? And granted the design process ends up being somewhat long with um, you know, having a series of meetings about maybe there's an introduction, is this the right group for me and maybe a second one about well, this is what we're thinking about, what kind of work have you done, and then maybe even a third one where it's like this is actually what we need to do, we've got to design this, where do you think you can take us? And even then it's kind of thinking on your feet. But in that case, of the third meeting, it is a great deal more ? on the designer's part. A, they haven't totally been introduced to the project. B, they can only call upon the experiences that they've had. And even at that point in time it would be a bit unrealistic for them to have a ?? on them at that point, because it probably would have been something, as you mentioned, that you had thought about, and considered, and been able to mull over. So um, there's definitely something that I need to keep in consideration. Uh, who benefits from this research? Theoretically, the designers, because they'll be able to better communicate with the client, um, and then the client because they'll feel as though they have been heard, their ideas have been communicated and accepted in a way that it isn't an exercise in kind of letting go and relinquishing, you know, to some degree they have to relinquish a certain amount of power otherwise there's no point in hiring a designer, but I think there is a difference between the communication of the core message or the idea. It reminds me of web design, when you see the ones that area already formatted. They're basically just kind of put your information in. And that kind of design process in and of itself. And then the ones that actually are custom made, that actually communicate a passion, a message, a desire, a methodology,

An ethos of approach.

K: Exactly. And visionaries. Um, the communication of an idea is very very complicated per se. I mean it's something that you envision and communicate. I made a challenge of actually communicating, which theoretically you can't do, because it's just dependent on the other person having been able to communicate with you on the same level, having the same associations, and so on and so forth. So ...

I think – are you coming at this from sort of a software - ?

K: No. Software was an example.

It's just an example. Because I think that is a completely different challenge, it's the sort of stuff that we're looking at here, because everything we do here is so visual. It's easy to create that vision. Much easier. And easier for the designers to show where their inspirations come from. So often they will bring to the table when they're introducing new design work or looking at their first stab at a brief, and bring boards of this is where we're feeling inspired from, we've taken this problem and looked at it from these different angles, so this is where you get that colour palette or this structural shape or why it feels organic or you know, whatever. And they can sort of really bring that to life, and that makes a huge difference when you're trying to communicate something.

K: And I feel that sometimes I look at it from the client' s point of view, and their ability to communicate what it is that they're envisioning, knowing that they may not be aware of semiotics, they may not be aware of associations or – or any of these other things, or even why some typography works and why it doesn't, and that becomes evident in some of the – it's kind of a blessing that it occurs, and ends up being evident in some of the suggestions that they make from the outside in, if you are in software development, and you want to run a campaign and the suggestion is to put it on ping pong balls, there are probably some things that we need to talk about as to why that may not work, but rolling it back to the communication about what is there to get excited about, it's not always the delivery that's kind of the key point, and I suppose that thin-slicing it too – going off into a very visual, you know, existential moment of saying "oh yeah, I can totally see where this is going", "oh yeah yeah,", and I totally see how we can solve this problem, or this opportunity as it were. I'm concerned with both equally as communicating, what is there to get excited about, or what is the solution per se. Um, so where do we look? I love that we, I'm not sure I'm ??? for we. [laughter]. Well, the other part of it is, I think linguistically it's probably a little more consistent we. I just love that, when you're kind of the low man and the total ?, we empirically means you.

???

K: Exactly – there's an e in team. There's the areas that I found to be quite important, even though they seem quite broad, um, they narrowed a little bit by the scope of ideation within the design process and how I've defined it, so what is the purpose of ideation? Ergo, what is really the purpose of – you have to kind of look at the purpose of design and the purpose of the designer, a lot of it ends up being money-related, it's kind of like creativity in order for, in order to have an outcome, which is typically money-related. Which at times limits the scope that you're able to do, it's kind of the scope that you had mentioned before about, you have a certain parameter in which you're able to work and you're expected to have a return on the investment, and that in and of itself kind of narrows your ability, that area of creativity, down to – it's almost ?fractal-like. You can go from one – you can have an infinite amount of ideas within a finite space. So it is and it isn't, but by and large I like to at least acknowledge the limitations and how they can kind of reinforce not necessarily creativity for the sake of solution-finding, but a creativity for, as a problem solving approach, and I think that there's a bit of a difference between the two.

Interesting that you say there about how Western culture defines ideas, because a lot of the work we do here is about global solutions, it becomes kind of quite an interesting challenge. There's a project that I didn't actually work on but was for Lux Soap, and they were looking at – it's all about revealing beauty, you know? But the idea of beauty in an Asian country versus in Brazil, or wherever, you know, they're very very different ideas. So trying to kind of break out of our Western way of thinking, trying to be a bit more lateral, and apply that across different markets is quite a challenge, and is something that you have to do quite a lot, to try and understand where the best common thread is as opposed to the easiest one. So you know, thinking about – that actually is something to be challenged, I think, people have to think beyond that.

K: I found from the perspective of ideas, I was interviewed a???, I spent some of my growing up years in Japan, and I've lived in Panama, and...

So you've been about a bit.

K: Gotten around! But not purposefully, it wasn't as if I went to Japan to speak with priests and meditate or anything like that, I was just there. And so, some of the experiences I've had I can't necessarily differentiate and categorise in a certain way, but you just kind of all run together in a way. But I've realised um, in looking up some of the definitions and some of the origins from Greek culture about the idea, and following it through, Romanticism, Christianity, so on and so forth, that there are some really heavy associations between ideas and forms. And that influences our ideation and our design process where, it's almost, I think it's almost a given that when you sit down with a designer something will be made. There are reasons behind that, and I think those are kind of – they're necessary to understand when I was looking at sustainability, how can a designer provide a sustainable intervention when really what they are focused and what their job is to do is to make. To envision, and to bring eventually to reality. And one of the other issues, when it comes to that, is how it's seen as a profession. Now the designer goes into meetings and says, well actually you shouldn't' make this. That would – I think that that would happen very often. If you go to a doctor's office and they say well, you have cancer, there's no amount of money that's going to change that answer, there's no gerrymandering, there isn't much of a conversation going on. But there is a great deal of conversation with a designer, even though they theoretically know, say they just decide to make ping pong balls, that it probably won't work, and they know why. They'll end up getting made, they'll produce it, it'll end up being a bit of a waste, and so on and so forth, so there's a difference between how the ?career is seen, and it does affect how we ideate, how it's taken into consideration as a ??? situation.

But the problem is as a designer is we're always at the service end, we're always servicing clients in one way or another, so they always have the final say. And if they really want to make ping pong balls with blue blobs on it, regardless of how much you can tell them it's wrong, they'll still do it.

K. Yeah.

They think it's the right thing to do.

K: Exactly. But I think on top of that, some of these things may go without saying but they need to be said, because they kind of inform the way we make our decisions and how we go into an ideation process. They inform the ideas that we consider, they're ones that we're not going to consider whether it's personal preference or because of the brief. But an ideation is a much broader process of ?these things, and it's much more narrow because of our culture, because of what we know and how we interact within the process. So understanding the limitations to describe ideas. The limitations you know, you had mentioned some of the tools designers have to do that, whether semiotics, boards or drawing or some of these other things, but there's also phenomenological process where there aren't always words when things are being visioned. And there aren't always things within our world of forms that we can associate to it, now it gets into a bit of theory about whether our ideas our all derived from form, whether we actually wouldn't have an idea without being exposed to a physical world.

A bit existential here!

K: And I'll stop there! Those – I've gone kind of to both extremes, culturally we're in an extreme of form, where all our ideas are thought of as being informed – and I pulled it in the other direction because I find myself really, really diametrically opposed to that, because it means there will always be stuff making things, and I just don't see that being the pinnacle role of a designer, or even a person per se. So – and we will barely touch on quantum mechanics and chaos theory. The only reason why I bring those up is because um, because of the one plus two equals three – science has a different approach in trying to understand reality, where one plus two doesn't always equal three. The thing is that you don't actually for sure know, and that I think needs to be taken into consideration the way we think of ideas. It's either a knowing or presumption that these things will equal the ends. I think if there's a way of associating that, or even taking that into consideration, in an ideation I think it would be a little closer to reality than the things that we think it depends on currently, which is more dualistic. But ??? questions.

Okay. So right. Yeah.

K: Copy?

So how do I help you with this process? What is it you want from me, because I'm hearing you say, and I'm – we approach what we do in a very specific kind of a way, and the design process that I understand is kind of, sort of touching on – it feels a little different from maybe some of the things that you've been experiencing recently, just because of the nature of the kind of design work that we've been involved in tends to be much more literally physical, tangible. You know, I mean even when we're doing things like Ronnie Scott's and stuff, you know that –it's a very physical output, much more so than some of the things – designing the software for a phone, or designing software of any sort, is a really different, I imagine, ideation process, and sort of thing that designers who are structurally or graphically focused will be thinking about. It's sort of –

K: Just so – I think I need to reiterate something. I've done programming, but I'm not a programmer per se. It's not my profession, I'm a designer. So my role in Symbian, that's what Symbian does, they make software. My role there – I don't do software. I don't design software, I don't have conversations about software. The only way that I would actually have it is how to graphically represent it on a timeline. That's it. So the approach – what this conversation can provide to some degree is what is it – what is your approach? I mean, either when you're mediating between designer and the client, or when you're left to your own devices to come up with solutions, what are some of these things in the very beginning that you're taking into consideration, what does the picture look like, and then it'll probably elicit some questions from me, you know, just trying to get a better idea of how ???

Do you need some more coffee?

K: No ... it's a bit like drinking tea [inaudible]. But um. There was one group that I worked with and it was really funny. They were my first case study. And it was – it was Moixa Energy. And basically they made a battery that recharges in the USB port. So you have a battery and the cap comes off and you plug it in. And it was really funny because there were many, many, many conversations about what – no actually it was interesting, because it wasn't so much they were envisioning, but there was one who was envisioning results, but they were based on what other people had done, so they worked for them it should work for us, had nothing to do with their ??, had nothing to do with their messaging, had nothing to do with what they wanted to do long term. What it was was a trend that they saw and thought that could be applied to their work. And so there were quite a few conversations that we had, negotiations, about why you know, trying to get to the heart of what it is they

were actually interested in, or excited about, or whatever else, and saying well, these things can be incorporated within your brand, but the messaging will be different because you are in fact different, I mean, what you're selling is different, I'm talking about people who sell newspapers and you're talking about batteries, I mean – you're talking about different demographics, different clients, and I tried to bring them back to what their product was, and what they were selling, and it wasn't just a product that they were selling because people wouldn't simply buy a more expensive battery just for the sake of it. And it ended up coming to a very interesting point, where I said well, you know theoretically, from a sustainable standpoint, you probably shouldn't be selling batteries anyway. Because what you're trying to do is take a larger pitch in the market, but without others not buying other batteries and without the ?population – people shouldn't be buying Duracells, Energisers and so forth, so basically the market is growing, and you're adding to it, so it's kind of, theoretically if you take your batteries off and they take their batteries off, that's actually doing something. Putting more batteries on to the market is – and he kind of laughed, he was like, okay, that's a good point. But obviously he still wants to make his ?? payments, so that wasn't necessarily sort of... But there was a kind of, you know, to some degree it does end up happening that – the reason why I brought this up is because when we're talking about software design...

No, no, no. I guess that's what I was trying to understand where you were coming at, the whole ideation, because it's very different depending on which bit you're tapping into. MPD is different again from design per se, you know, from my point of view, trying to come up with a new product to fill what is perceived to be a gap in the market, you know, is quite a different process, and that's where you have more people involved, that's where you – you kind of go at it from the other way round. MPD ideation would probably include as many people as possible, clients, designers, innovators, research agencies, design agencies, you name it, you'd all get round the table and start throwing ideas together, you know, that's the way that that works, so you'd sort of start very broad then you'd go off and try and make it work, then you might go to research and try to bring it in, so it's almost like a – it's a funnel, actually that's what you should call it, the innovation funnel, for MPD work, whereas from a design point of view, which is really what we evaluate here, although we do do MPD evaluation as well, but it's at the evaluation stage, not the ideation stage, that tends to be a different process, where you get the brief, and then the designers take it out like this, and you go through an internal sort of ???? present it to clients, they??? Off, then we get it, research, and so it's a different kind of funnel altogether.

K: Okay. So maybe it would be easier to talk about an innovation funnel. Because by the time, if they had hired a designer to come up with ideas, and then you know, brought down the two to you to say, okay, are these viable, that would probably, that wouldn't necessarily be an ideation I'd be interested in, so I think kind of, the innovation funnel that you deal with is probably – can you describe it, since it 's not something that I normally deal with, normally I have a one on one with the client, and a one on two with however many clients are at the time. What you're describing seems a bit more collaborative. I mean, how are people bringing their ideas in, is it starting off with the brief? I mean, can you give me a little bit about?

Okay. Well, it's totally dependent on the client, but I was trying to think about when the last big MPD innovation things I did, and that was about 2-3 years ago now, because obviously been focusing more on design which is a bit different. But, invariably these things come from a client Eureka moment – "Oh look, everybody's trying to do it" – healthy, tasty snacks – or food – that's just the major battle at the moment. Somebody out there went out and did some trend work, and said do you know what people need, they want healthy, tasty, snacks. So a balance of taste and health, and that's honestly, every client for the last three years, has been trying to come up with something to go into that. It's just ridiculous. Anyway, so you'll start off from a – "we think we've got this brilliant idea because". This is a big trend. It usually taps into something that's happening currently in the world of consumerism, that will spark this as an idea, like we've got a gap, or there is a gap in health and we think we could fill it from where we're starting from. And that will be usually the heart of, how do we ideate around this? And then you'd spend a day with some sort of workshop where you'd literally have a lot of other products, a lot of other stimulus on the table, it doesn't necessarily have to be direct products, it

could be from way outside of the – you know, if you're talking granola bars or something, we might look much broader than that, you know, and all sorts of other ways of pitching it, and start kind of creating some sort of framework about it, so what are the options that are open to us, and how do we populate – you might come up with an ?axis so you've got health and taste and premium and I don't know, everyday or whatever, you start to populate your axes to sort of see something like that, start sort of working out what fits in where and how do they work and what' s fine.

K: Do you know Malcolm Evans? That's all right. I attended a talk of his.

Who's Malcolm Evans?

K: Dr Evans is um, I guess he wrote a book on semiotics, somebody came into Goldsmiths talking about semiology and semiotics.

Yes, now you see the semiotic stuff for me isn't the innovation funnel. That's something that would feed into design work. God, this is so confusing, isn't it?

K: No, no, no. Because I found semiotics from design.

Yeah, and that's where you would use that, mostly. But you can – I mean you use it as a shorthand when you're trying to present MPD ideas because you know that if you put on a green swoosh it's going to feel dynamic and ??? – whatever, you know, so you can just communicate the idea really quickly. But yeah, MPD ideation is sort of different because you have to start so broad. And basically then often you use consumers to sift out bad ideas. When you're looking at stra? Redesign, repackaging, you know, maybe new ?, coffee cups of something, then that will be something that you would do, a design agency would do. But what they would do in terms of trying to generate ideas is, they do a lot of planning. They do the elusive ... they seem to know what planning is but just going out and just [??] but ... so you sit down and you consider the market place and you consider what's out there and you consider what you can borrow from other categories and so on, to put into that, to give you more inspiration to break out of the norm. So you can see [???] white cup. Have you seen those ones ? teeth, or their noses or stuff, you know, just sort of ideas. Teeth at the bottom or whatever.

K: Or a sippy cup.

Yeah, sippy cups are bizarre. I can't remember why I was telling you this. Sorry, I am going round in circles. I am not quite sure you know... I am just trying to explain to you about the difference yeah. You might ... yeah, to really ideate and PD tends to come from a very specific point but needs a lot more input, much broader I think at the beginning. If it's about a redesign you will be issued with a brief from a client, in the same way I think you've been working of late. You know, they have a very specific view of what needs to be developed, one way or the other, and then you kind of come back and put options on the table. And internally you go through a large amount of ideation but want to get out ... some people necessarily involved too early in that process because you are using the brief to work against. And if... and the planner or the account manager of... no it's more the planner, should be holding the cards in terms of, this is what the brand stands for. This does not fit with the brand vision or the brand values or actually, this is not something to target consumers [??] so you have to hold all of those sort of measures and that is what you use as part of your checklist when you're going through the different designs. And so on the checklist will just be things like mandatory things you can't

change, things you can change, budgets, calls? [???], you know, all of those sorts of things will be...

K: Yeah, and we're still kind of on this ideation? These are some of the things historically speaking or you know, academically speaking, you know, ideation as being um, it's um, semantically it's very weird. It's just so ...

Well, that's the whole point isn't it? You see, ideation is literally the creation of ideas, yes?

K: Okay.

But it's the framework in which we're working. Are you trying to create a completely new product from scratch which has a different kind of, a really different sort of set of process and how you do it, or we're talking about design ideation. We're starting from a very specific point and you know what your current status is, you know, or if you're creating a [??] or a design for a new product, you will understand what it is that you're trying to communicate. Ideation of a new product is a much more open process. It's about like, we have this one need here. How do we... how can we best service that. Let's come up with all these different ideas that are differentiated from whatever else is out there in the market. It's one thing we do believe, or I do believe, is that there are no untapped needs. They are simply... everybody is simply now trying to find better ways of servicing the needs of [???]. I think in the 50's and 60's there were lots of things that people didn't realise, you know, there were needs that were not catered for. Now everything is catered for and...

K: There is a little bit of reading I was doing, [??], who had made comments about the needs, I think it's more the socialist, but he was talking about capitalism and the dynamic of needs and he ... I believe he died in '51. He wrote the book in '45. And he was making a comment about how the needs will never actually be met and that they can't be met. And actually I was looking at the role of the designer in creating wants and needs - you need this, you have to have this and so on and so forth, and that dynamic as per the role of the designer within you know, the ideation again. And that's where I went back to the comment about, you know, is this an ideation? Is this really either opportunity finding or solution finding in the role of design within western society currently? Design within the eastern culture is a little more holistic. The brand is all ?true as opposed to strictly owned by corporations. So um, their cultural ideas and ... the first one that comes to mind in [???] is , what does our culture stand for and what are these things that we hold as you know, cultural needs and what's important to us? And so at one point I was looking at you know, holistic ideation, a holistic approach or holistic methodologies, um, which would be a little more inclusive. But what you're talking about and what I need to consider most, and I really really thank you for taking the time to speak with me is, what is the real... what is a realistic picture currently? What is ideation right now? What is the approach? Whether it's new product design or design per say, I do ... I like to think that I do design and you know, there's actually a job that I turned down on Monday because I saw the brief and I said, you've got to be kidding me. It was just... this isn't going to happen. And there was just someone who... it was Creative Lewisham need a website and they had already run down their menu items with ... making no sense because there's no association from their meaning to the end users. There's no user interface consideration whatsoever. Them on the maintenance side they had no clue as to how they would actually update the website, so they put down ... they put down a requirement that isn't realistic. They don't want to run any new software, have to you know, like, exactly, I can't take this – there's just no way –

Hobbled, shackled and handcuffed all at the same time.

K: Yeah, and I said look, here's the deal. I will consult for you, because you need help. I said if you hire a

designer at this point in time, you're going in with very unrealistic expectations. So anyway, there's aspects, there's real aspects to design and people's expectations and motivations. I'm just

That sounds like problem-solving, that particular brief. So I think it's just, you know, ideation takes many forms, doesn't it, really. You know, in an ideal world, it would always be very blue sky, you would always start off by saying let's just ignore everything that's out there, we have, this is –

K: Yeah, but you can't, and you never do.

And depending on how close you are to being more about problem solving than you are about clean slate, it depends, will have a real effect on the ideation process, I think. Because, what's the point of getting really over-excited and getting everybody really inspired when you know, actually, 80% of the work that you do won't be considered. So there is an element in that, how much free rein have you got, how revolutionary can your idea be? And we work very much into, is this evolutionary, is this revolutionary, because it totally dictates the amount of work, the amount of research or whatever you do around it.

K: Now how do you really associate that now? We didn't get into existential, but by the language that you're using of what is evolutionary, what is revolutionary, and then associating those things with research, how are you defining your clean slate, how are you, you know, is this almost an emergent thing coming from your iterative process, do you believe that?

Um, oh. It doesn't' necessarily come from us. If you're in the design side, you will have to ask a client. It's from the client, whether they're feeling brave, how far they're willing to push. It also depends incredibly on what brand you're working on, the whole, the history of the brand, how big it is, you know, there are certain brands you just really wouldn't want to shake up. One of the things I worked on , a very very long time ago, was Smirnoff, and I don't know – they've had a redesign so actually now I ??find this odd, but at the time it took to get to that, and actually that is quite a revolutionary change from where it was. It was in a standard bottle, with a very big sort of white label, very very sort of tapping into a lot of heritage cues, in a big way, lots of ??, shields, medals, blah blah. And really one that now , it's a tall sleek bottle, it's very cocktail shaker kind of thing, it's got a tiny little bit of badging on it, it's all shiny and silver and it's really modern. You couldn't get further away. They really are quite revolutionary. But it was felt that that was needed. Because the vodka market had taken a leap like this to be the biggest thing. And Absolut had obviously led the way there. But the interesting thing about Absolut bottles is that they only made it like that because it's a governmental-made vodka. And they couldn't' be arsed to actually design anything... [K laughs] That is quite honestly, genuinely, the truth behind that bottle. You know, they couldn't' be bothered to properly design it so they just put some ?blurb on it. Shipped it out, and it's become one of the most iconic bits of....

K: So ??

It's bizarre, isn't it? So yes, that one, that came from a real real need to shake the brand up, and also vodka being the kind of category that you could do that, you know, because vodka is about modern, cutting edge, contemporary cool, so therefore to make that sort of leap, go to whisky – sorry, I'm using spirits because I've done a lot of spirits work – but you know, you go to whisky and you can't do that, you're talking about very evolutionary, it's about taking what you have and making and improving upon those elements.

K: Like Jack Daniels.

Jack Daniels has barely changed in years, you know. All they do is they've tidied up that label, they've just smartened out, polished it up now and then and that's about it. That's an unchanged thing for years, you know. So you can see where you have that stretch, and it pretty much depends on... That has to do with the brand, category, the context, how it's used, it's quite a lot of things that we consider, and then we also research that as well, so we look at stuff in context, and there's one thing we can sit here and have a discussion about the ins and outs of this ?? and whether it's aesthetically pleasing, but actually does it store well? Can you carry it well? All of those sort of contextual things are equally important when you're looking at that sort of stuff.

K: So the designers, they use the values found in the form? Okay. Your personal ideation, your personal eureka moments, do you have them when you're doing research?

Yeah I do. They're often sitting in the bath, though. No they do tend be that.

K: I ran into someone at the Smart labs, who was doing research into what- where people have their eureka moments. So she actually had done research as to where they are, she had an acronym for it. One of them had to do with water. Yeah, scientifically speaking it's a ?doozy

Yeah, I tend to sleep, that's usually the thing. Subconsciously my brain filters the stuff out. This is where – you know when I was sort of talking about having models of thinking, or understanding, even if you're just talking words it's yeah, it is about models of thinking, and usually it's quite hard. There's lots of different ways of communicating the base idea, the base information that you need to get across, to understand why certain things are important. And those are the eureka moments for me.

K: Okay, so you're probably being more like strategic intuition, as occurs to –

Yes, mine is much- it does tend to be more about strategic – those are the eureka moments, you know. You can – and that is your thin slicing thing. I know what's important, and I know what genuinely is a eureka moment and what will make a real difference.

K: Well there would be a difference between strategic intuition and thin slicing. Thin slicing is walking into the room and saying "that ?cup won't work". And then the strategic intuition is actually your ability to do it with knowing what your thin slicing is about. You know, just really saying, kind of, setting forth after you get the brief to say okay, we know this, how do we go about the other way, and that's your strategic intuition. Theoretically. Well, these are all words that we use in order to make up some phenomena that you either hone in or you learn or that you use as a methodology. So for me, sometimes, the categorisation is an explanation, a post-haste explanation for some of these things. A eureka moment is a post-haste explanation for some of these things. You have an idea – sometimes you're not even sure why. You were doing something totally different, and the connections that you make that are associated to the solution that you found are interesting because in the case that you had 26 options, some of those inspirations are so far away from what the original was, that it's only afterwards that you judge its worth. And those are some of the areas where I?? Are concerned, because actually the clients could have been 27, and it's not considered for whatever reason, within the realm of ideas. You see the thing is that some of these ideas don't necessarily fit, and when it comes to making a form because there are criteria and there is a great deal of thinking that goes behind design, I mean it's almost like the perfect

marriage between imagination and thinking. Hm. Back to eureka. Back to your eureka, by the way.

My eureka. I was just sitting here sort of thinking about, quite often my eureka moments are, they're relevant to the project but they tend not to be always the specific thing that we set out to do. Those are really the things. This project that I'm doing, Betty Crocker, you'll probably be more familiar with it than most people in the UK. But we're looking at some stuff, and obviously we're looking at evaluating some design work for them, and for them that was this piece of work – the end result of the project was to identify a design or two designs to be developed and go further forward. My eureka moment though, is, brief??? Because what they say as being one thing is actually an ?axis, and they hadn't even thought about it like that. And that was because – that for me – they hadn't thought about it like that, and almost – it's not irrelevant, it's not irrelevant at all, but you can't evaluated, you can't get to their design end result without actually not acknowledging that their brief isn't right. And the only reason we know that their brief isn't right is because it's not necessarily exactly – it's not a literal ??? for consumers, it's about the next step up. And that's the stuff that I will sleep on for two days – that's working for me.

K: That is um....

Because that particular debrief was relatively recent, but just to go into round two now, I kept sitting there just going I'm not comfortable with this end result. I'm hearing what everybody's said about these designs, and I've listened to all the stuff coming back and – this was something completely outside of what I'd been told directly, you know, it's more about association. And those are the sorts of things, for me, I get excited about. Even if the client may not want to hear them, because I suddenly realise that that is the reason that this doesn't work or that is important or, you know, how to develop stuff...

K: That's the part we're most interested in. This is like the best two minutes – this is it! This is - how do you communicate that to the client, to a degree. Within –

Oh, well, you just tell them straight. I know that sounds ridiculous, but it is..okay. Quite often it's about let's go back to basics, you may not want to hear this, but actually this contextual stuff is really important. You know. Because all they want to do is cut to the chase – do they like it or don't they. And actually it's like, you can't just do that. There are so many other factors at play, you have to walk people through.

K: And when you talk about walking them through, are you walking them through from what it is you know or from their standpoint? Okay, you've done this research, for better or for worse, either the research, the moment, the subconscious, you've done this and you've come to this feeling, this idea, this combination to the two where you're like, okay, I get it now. Um, now when you go back to the client, this is the part where it gets a little bit iffy with me. Simply because it's not actually a shared eureka moment. I.e. because a, their brief in certain terms can't represent a eureka moment but it's how they're using language in order to describe it. You're going to use language in order to describe yours. But the eureka moment actually was a feeling, when you finally had, okay this does – I know now. That's the eureka moment, now you use language in order to communicate this to your client. Your client used language in order to describe a goal. Not necessarily a eureka moment, so when I think about having a shared one it's going to be difficult because the person who had the same moment that you had which inspired the brief, may not be prevalent within the brief any more. It may have gone through iterations to where it doesn't necessarily communicate that. So, is it you who has the insight to see that within the brief and communicate that, and try and associate a shared moment, or does that become irrelevant, and it becomes, again, a one-sided conversation, where you're problem-solving, kind of going backwards to say you know, I need to cut to the chase, this is why this brief doesn't work. I'm just wondering whether there was a moment, in that

brief, that was a eureka moment, that inspired the brief, that you actually end up communicating with through what it is that you know, that you've experienced?

Okay. The brief, I know for this particular project, was inspired by other work that was being done, which wasn't to do with design, it was to do with making mix, cakes, that sort of thing. And they've been very literal, they've hit on this particular insight which is all nice and warm and cosy, and they want to make Pat support that insight, because Betty Crocker in the UK is quite a small brand at the moment, so they have a lot of marketing spend, so every touch point for the consumer has to work really hard, that means that every bit of communication has to be really cohesive, you know, and probably more so than sometimes you maybe get when the ?pat might pick off the credentials, and the rest of the advertising will do all the fun personality stuff, so in this case, it actually has to be a bit closer in. I don't actually think the clients have been inspired. I don't think they've had a eureka moment, I suspect, and I think this of a lot of my clients, will also be in the job of just churning shit out. I really think that is what it is. Oh God, oh yeah, doesn't really work, think it's a bit rubbish, blah blah blah. I don't think they always get very inspired, or they start off really inspired and then they close down, they get very really scared again, and that's quite interesting. So I don't always think they think about it, and in fact there isn't really a brief for this project. Not in the way that I would ever have written a brief. It's very wobbly, there aren't very clear what are we trying to achieve action standards, you know, that sort of stuff. So I've written them on their behalf, because otherwise I know I'll get to the end of the project, and I won't be able to give them a straight answer, because nobody will have agreed what it is that we're looking for. So...

K: It's a bit like a PhD. [laughter] You have to make sure you can answer, or definitely set up your own rules. Wow. That's beautiful.

I don't know whether that's helped you in the slightest, actually.

K: That's totally helpful. On one hand...

It's given you some other things to think about though. I was going to say, have you read Karaoke Capitalism?

K: No.

Oh, I think you might find that really interesting. It's all about the idea that somebody comes up with a really brilliant idea and then it's never going to be executed perfectly in the first ???, and if you're the right person you'll get in there immediately afterwards, take that idea, and improve upon it. And make it even better. And then you'll be the person that makes all the cash, not the - -

K: The entrepreneur. Yeah.

Well no, not even that, it's not even the person that comes up with the idea in the first place.

K: I don't know if entrepreneurs actually do that, though. They're the ones that se the opportunity

Yeah. Well, ??? Blimey. Oh yeah, it's maddening. I saw him present a paper on this, at some.. ?Kell ??? He's written a couple of books, actually.

K: I don't know if you're interested, but um,

It's really – he did the most amazing presentation. Half an hour, no notes, just a huge screen of random images, I was so inspired, actually, it was really interesting. And Funky Business is the other one that he's written, which is quite interesting too. You can get them together, that'll be it. I'm sure I bought them together when I bought them, so. I suggest having a read of that. It's really interesting and inspiring.

K: Um, are you aware of the Black Swan?

No?

K: Okay. The Black Swan, the reason why I brought that up was because

Yeah, I just bypassed that one.. [laughter]

K: The Black Swan is one that – I'll have to look it up on here because the person who wrote it is doing a free talk in London next – today. No, tomorrow, because I leave – he's absolutely amazing, only because Black Swan events are unpredictable events with high impact. Absolut would be a black swan event, 9/11's a black swan event. Um, anyway, if you get a chance, and it's so funny because I came across the book, I came across the terminology probably two months ago, and then a month later I'm sitting in the Underground, and I'm like okay, that was just so wrong, because a lot of times when I became a little afraid of some of these things, during the research, and then, it has to be unique and it has to be interesting, in December initially I was working on the shared aha moment. Aha was coined by someone who published a book in December. I was like, oh, that's lovely. So it was um, and the other thing is that doing a PhD I think I'm in a hole and no-one else is in it, and the other thing is I don't think that there is necessarily a great deal of – Nicholas Taylor, Naseem Nicholas Taylor. The impact of high improbables.

Cool. I shall have a read of that.

K: So, I read that in tandem with Strategic Intuition, and mine is kind of somewhere in between. But yeah, Black Swan events, kind of goes back to chaos theory, where you have something, where you just have things that are, things that within reality aren't always explainable, and aren't always predictable. And sometimes the design approach depends, through its iterative process, on being dependable and coming out with something unique. It's kind of an oxymoron. You're doing it to come up with something unpredictable, but you're doing the same processes over and over again. That's one aspect of it, that I think is kind of weird and magical, but hardly gets acknowledged. But I really want to thank you for taking the time to .... with me. Hopefully it's been interesting for you as well.

Not at all, it has been. Existentialism...????

K: This is for you, just in case.

I was going to say,

K: Actually, there are two.

Thank you very much. And, you know, you know where I am if you have any other things you want to –

K: I head to the States tomorrow. I'm going on holiday, first time in two years.

Ah, lovely. You're going home, I imagine? Where is home for you?

K: Well, I have family in Boston, but I kind of call my home Santa Cruz. And actually I'm not going to make it there, but I'm going to go back to Seattle, my alma mater, and some of my teachers, and everything else, and it'll just be – I mean, most of my trip is planned around food.

Food? [laughter]

K: Lasagne in Boston, in Seattle I'm having a decent cup of coffee, and some tofu baguettes, and Thai food. And San Francisco, there's another vegetarian place, and Chinese food, and then LA, so pumpkin pie.

Oh for goodness sake, that is a ridiculous rationale for a tour!

K: Well, these are some of the things I remember from being in places, because people move, and people change, and you can't always get together with them, and I'm having a bunch of friends at a bar in Seattle, but those things aside there are lots of, um, it's a very easy way to go back to a place and kind of experience it. A lot of these places were work-related, so I really do not want to go back to ?Sega when I go to LA and say hey, how's it going guys? That's not the plan. So it's good to go to a place where I've had some really great moments with friends, and either go out with them and have drinks or what not, or – I mean I love food.

Food is always - I'm surprised you've found some good Thai food in ???

K; There is, there's a place on Greek Street, and something like that.

Have you been to the Sabah Thai?? [ends]

K: Doing PhD and then I am doing [???] where I am going to have [???] that we have ?trying to give [????].

CL: Right so I think last... I think maybe last time I spoke to you, was it when it was John's crazy events where people were running around and touching noses and elbows and things like that?

K: Yeah. Wow. Therapy really did [???] that.

CL: I was getting another person to touch noses

K: Not a lot of people can say that. Oh my god.

CL: I think your PhD is something to do with refrax??

K: Well, that was the MA. Basically it was kind of looking for patterns in design. And the PhD has to do with conversations between, well we should probably skip that. I can tell you at the end.

CL: Okay, sure.

K: That kind of spoils the whole conversation if we talk about what it is that we want to do. But actually we're here to talk about you and your needs per say. So what are they? I mean I received the brief and it talked pretty succinctly about a website that you guys are trying to develop.

CL: I'll just run through the [???] project. It's ... the actual ?Shirat event is a, going to be a 5 day design event involving... the area in question is centred around Deptford ?Creek. I am not sure if you know... it's 21 different freeholds so 21 different separate owners and it's been in there... sort of loggerhead position for about 20 years and nothing's really... there is some [???] activity going on around there. You've got lots of creative businesses, creative ?side artists, that kind of thing. Generally the area has a lot of potential to sort of boost regeneration and boost the [??] activity but nothing 's happening. Partially because, I have discovered because of the politics between Lewisham and Greenwich. It's sort of ? between the two. So this event will bring together, hopefully, everyone from planners to landowners, developers, local community, local businesses, all together to this design event. So we will have a design team working every day. We will have 3 large public meetings so we'll have feedback on the design work. And you'll also have smaller meetings for additional stakeholders within that. Does that make sense?

K: I...it does. I definitely have some questions. But please go on.

CL: So for the website it needs ... the website needs to perform quite a few different functions.

K: Okay.

CL: It needs to be... obviously we have a Steering Committee which ...it's basically the main people working on this project, myself and Andrew Carmichael, who is the Director of Creative Lewisham, who you have met?

K: Yeah. I did a talk for the [???] at Creative Lewisham.

CL: Oh right.

K: And actually I sent him the paper that I did for [???] and I think that ? publishers presented their ... so yeah.

CL: Okay, that's really interesting.

K: I don't know if we've rubbed noses. We've rubbed intellectual [???].

CL: Wow. So it's just Andrew and myself working on it. And I am the Planning Assistant. And he is Directing, so... and we have a Steering Committee, who we meet fortnightly. So the Steering Committee is made up of people from Lewisham and Greenwich supposedly, but there are political arguments, key people in creative business and people from Raw Nerve are involved, so local architects, local people from community groups, people who are sort of involved in community development and people from Lewisham council. We haven't got any one from Greenwich Council. So anyway, you get the gist of the Steering Committee, whose ... we feedback and brainstorm ideas and that's how the development process is held. So one function of the website is to ... first to share information with them and also to share information with the public.

K: Okay.

CL: And another sort of quite key function is for it to actually be able to explain the Shirat process which isn't sort of straightforward really.

K: Okay.

CL: [???] So it needs to be... so it's a communication tool really but we and [???] need to be able to update quite simply and quickly, because obviously there's quite a quick turnover of information.

K: Okay. I guess I should stop writing because [???]. How does this make you feel?

CL: I am being recorded.

K: Crazy writing. It's recording.

CL: [???]

K: I knew we should have had the [???]. The .... the overview is interesting, if not ... I'll be quite candid. I am a little tired. I'll just, okay... sounds like a mess. I... when I was looking at fact? In sustainable developments I ended up calling... I was living in Forest Hill so I think it is... I don't remember. Is that part of Lewisham?

CL: Yes.

K: Oh right. So I called them and I ended up speaking with the Project Manager. I recorded him too. In the area of sustainability his comment was that a lot of it was politically motivated and sometimes they're just trying to... I can't remember what it was but it was bit disheartening but it wasn't necessarily surprising. And I think it ended up looking at the Greenwich regeneration thing. Anyway I guess my point is that I kind of understand where you're coming from per say with the political stakeholders. As far as the website is concerned, maybe what I should ask you is, what would you like to get from this conversation or what are some of the things that... from my perspective, what are some of the key... I understand some of the key elements like this is used as a communication device. When you're thinking about the website though, what made you say you wanted a website? What made you... what was kind of like, what about it seemed like it was a good solution for you?

CL: It seems like a website is quite easily accessible. You've got almost a central hub of information that people can access and pull bits off and if you have... not like a [???] website really because that would just be a nightmare. But something that you know, a set group of users can update and share information on, which you can do over the phone and email just as easily and obviously they will be tools that we will use a lot. A website, it just seems that it could be a way of sharing information and PR in sort of one place.

K: Now with that in mind, were there some websites that you had seen that you thought, that functioned well, or what is it that you'd like to do?

CL: Actually I think one of yours, the 5, the one minute movie thing, is that one of yours? No. I think Andrew thought it was one of yours. I can't remember. Yeah, that was quite a good one. We ... these ...

K: Am I following you?

CL: You can do. I think Andrew would like to ... I think he would be quite happy for something to be very very very stripped down and simple and our ...and sacrificing... obviously functionality is essential for this but we've had a few.... come to loggerheads a little bit with our presentation in that it's ... it does need to look credible from the offset and I think sort of with something that is simply ... something that is simple, but you know, has a set design is very important for this because it can... I can almost see the project running away now and they've only been working on it just a month and it's just... it's quite a tall order for us to take on really. And I think ... I mean I think it will work out but sort of just how it will do that is the question.

K: So you want to have kind of a plan before you go into [???] to ... that's the direction that you want to take.

CL: And it's almost ... it is sort of very... the project in its very nature is very you know, an ongoing process, and

it will slowly build and build but... I mean an example is using Microsoft Projects. Are you familiar with that? You have to have a really clear idea of what you're doing for it to work. So we've obviously tried ... been trying to work in projects and it just hasn't worked because we're not 100% clear yet.

K: There's um, part of... this ... the brief that I received from you wasn't in a position that I could put my name forward as far as doing the design. And that was one of the reasons why I wanted to speak with you. Some of the reasons happen to do with some of the questions that I felt were kind of unanswered. Um, there were questions about how this represented your brand. Some of these questions are very design orientated, only because it's a corporate communication. Essentially it's a medium for ...

CL: Very good point. The brand is ... that's what I sort of... sorry, I am talking. You go on.

K: Please go on. This is a conversation.

CL: I started... when I first joined the project I was really thinking, um, quite clearly, um, and sort of quite logically about what I was going to do. And I have almost become more chaotic week by week which is quite... it's quite interesting to talk about it. Yeah, it's brand thing. It's something I didn't think about and now I sort of, ummmm , and it's not clearly communicated at all in the brief.

K: Well, there are a couple of things that will probably help steer it in. Okay, so if I were to hire a graphic designer for this there would be a couple of key things that I would hope they would bring up in the conversation. One would be branding. How does this fall within your brand? How does it represent your brand? And why is it that you're trying to say that follows along your brand? The reason for this is that anything that you produce, say from Goldsmiths, should still represent individuality and obvious other things. So what might help is to have a part of your brief that describes the ... either the ethos, the purpose and the mission of Creative Lewisham. So ergo when someone comes to you and, with a design that looks like this, you're going to say, this doesn't follow the brand. This doesn't follow our ethos. And you can have a conversation with them about how it should be going in the direction that you need it to. The other part is that, based on your ethos and based on your philosophy you'll start asking the right questions about the information that you want to elicit. It is outside of your scope, um, for example, to elicit our marketing information for newsletters thereafter, only because what you're trying to do... well, that is an example. In this case I... it brings up another point. But specific things about okay, maybe you don't ask about age. That might be important to someone else. And then what that does bring up a point about is, um, the information that you want to capture for future, uh, usage or, um, if you decide that you're not getting as many hits on your website as you would like and you realise that people actually would prefer to check their emails, then you can use a list that you've generated from the website and just send out a newsletter, maybe decide that the website is just a little too unwieldy and you can just do a Word document attached to whatever. One thing that does occur to me is, when you look at the culture of Creative Lewisham, and also the very logistical side of it, is it that you're trying to capture information and create a timeline. These type of things will often narrow down some of the scope of the likes and dislikes that you find in other solutions such as Wicky? It becomes important for you to ask questions about what it is that you don't like and why you don't like it and how another solution would be better, because I actually put Wicky down, a) because it's already there and all you have to do is put in information and you can allow other people to update it. The downside is that it allows other people to update it. The other problem is that I have used Wicky and I have used Tiddly Wicky and the organisation of it isn't always... the organisation of it, especially Tiddly Wicky is not intuitive. It takes a good deal...it takes a little bit of thought in order to put it in a .... if you're talking about something that's organic, that you can go back and have organised, Tiddly Wicky may not do it because really you do need to have all the information in there and you can create sub-categories but it will [???] down forever. It can drum down forever which may not work. I would also set up a

section of the main goals that would like to have for this. Is it archival? Is it information gathering? You do have it as a PR but that almost goes without saying. Anyone can see that it will represent Creative Lewisham and whatever is on there at the time.

CL: Yeah, the information or whatever.

K: You'll also want to consider how often you'll be updating this and what kind of information that will need to be there? And that's, I mean off the top of my head I think currently the largest issues are to do with um, the person or the people or the company that you set out to do this, because I think a lot of designers who build websites, they build websites. I'm not going to compartmentalise a lot of graphic designers because I don't know a lot of graphic designers per say and I don't want to generalise. But building a website per say is normally a corporate communication device and also they build it to grow and it normally takes on things like blogs and updating. Now live updating is, from what I've seen happens, is easier through a blogging or a wicky type thing. If you're still putting out information there in, there needs to be some kind of translation of what's inputted and then how it's shown on the website. There will probably need to be some kind of gatekeeper. All these allude to the issue of how you want to build your website. Um, I am imagining that email [???], that your host sometimes has forms that you can just do and post yourself, and [???] how it is on the website already as a tool. It will just enable you to kind of unplug and play. The only thing is that creatively or aesthetically, they'll kind of balance off each other. It's very very limited. It's almost like... it's kind of like a paper cover type thing where you have the menu here and whatever else, and sometimes those things work. You just need to put in the right imagery and the right colours and think about, um, how you ?chunk the information and ensure that there is some kind of clear dissemination. And for you guys particularly, I was reading some of the language that you were using and some of the menu items that you have thought about, and they meant absolutely nothing to me.

CL: Yeah, that's it. That's a good point, and also one of the things that I should have said at the beginning is that we working to a sort of framework that has been developed by the National Shirat Institute, which is... to some extent it is good and it's very structured and it doe sort of take you through different stages from stakeholder analysis which we're doing now and the mission statements, Shirat products, blah, blah, blah. But the um, the ... like this framework has been developed over in the States in quite different areas and where there's not so much um, the problem is more sort of reducing urban sprawl rather than, we've got this very very complex area with not much land with huge amounts of contamination and very sort of difficult political situation. And it's sort of this um, framework isn't really fitting so well. And also it's not, possibly not the right way to use this as a communication device really. Do you see my point?

K: Um, yeah. There was a ... Izzy, I was speaking with today, [???] this morning, was talking about how she had a moment when she realised that a good solution was a good solution. The solution that she had just didn't fit in the framework for the scope of the brief. So there was actually a problem with the question that was being asked. There was too [???] to find solutions. And like, sometimes you have to ask like questions. Um, it really, I mean, without being too specific about um, I kind of hit a bulkhead when I read the menu items. I wasn't quite sure what it is that you wanted, when you wanted something specifically out of it. So maybe when you rewrite your brief or you add to it you can say some of the things that you would like as outputs. So as a result of having this website you would like to increase... we would like to increase our hits or we would like to increase our readership, our information or whatever, whatever some of the goals you have in the short term and long term. I realise some of these take a good deal of time to figure out but, the more... the better the idea of what you have, the function of the website and how that website is supposed to function for you, the easier you'll be able to see whether a designer is able to actually able to fulfil that function. And the reason why I say short and long term is that the long term is, you could end up with a Wicky type situation where you can't actually access any useful information because you don't know how to organise it. Um, or if you do really want to figure out who is reading it and where they're reading it and how many people are reading it, you need a reporting system

and you just... and to some degree you need a back?? Now a lot of these things are provided by the host, and so they're kind of headache free. But when you ... but in the design brief that additional software, you know, running additional software wasn't really one of the things that wanted to do. It throws up huge alarm bells because in order to make a website you need additional software. Um, and I was kind of like, wow.

CL: Yeah, I mean that was Andrew's stipulation. I was quite happy. Because I do know ... I roughly go [???] and I would be willing to learn more to update, he said no way. (both laugh).

K: Fair enough.

CL: Um, and he just wants something very easy for him to do and time ? And we have had a quote from Raw Nerve which is quite a lot of money. Did you get the email?

K: No.

CL: No no.

K: No I haven't.

CL: They just sent it through today so I just sent it through to you. Let's have a look. And I think that um, yeah I think sort of the reason ... I mean the reason the price is high... maybe it's not high. You can have a look. I have never really commissioned a website l like this before so.

K: Yeah. I ... [???] These menu items are ones that you had spelt out. Correct?

CL: Yes. There's too much there.

K: Well I would just ? as to why you need them as opposed to why ??. This is one of the things that I was saying. As far as I ... this is I think one of the reasons why I rang you back and said, look, maybe we should talk just a little bit. I couldn't do this. I mean, the reason why I couldn't do this is because um, and this says nothing about them. They could be just as good as gold. The challenge that I have with doing it personally was that, um, when going through menu items and they're saying that the pages are [???] a content management system and so forth, um, with the same template structure, the issue that I have is contest... context is... so many of these words. Context is the... it's kind of the setting in which we are. Context is what you make it. Context also describes um, in a way the website. The website is a context. Um, and there's a context to the charades, then there's probably a better way of saying it. ? Context itself is going to be quite difficult to manage. History, um, the funny thing about design is that there are so many ways to say something and to communicate something but really it's kind of like, the professional aspect of finding the best way to do it. And as you were talking about um, uh, being able to see how this thing grows and seeing that it is emergent and that things are going to come along, it seems almost easier per say to have a solution that has a timeline. So each one actually builds on top of the other and you end up with like almost, um, just a line that keeps going and people are able to kind of scroll along and... but these are things that someone needs to challenge you on as opposed to saying that we're going to give that to what you're asking, because what you're asking is not for these menu items. What you're asking

for is a solution. And what I am trying to get to the heart of is what exactly that you're asking and what is it that's kind of motivating you to ask for within this format. Because then, you know, what I am going to do , and this actually just gets into the heart of my PhD. You had a moment where you had an idea about um, the web being a solution. I, as a designer, will now sit down and tell you all these things which I have known for the last ... the best way to go about it from a designer point of view. Your moment is theoretically a Eureka moment. It's kind of like when you have a good feeling about something, or in your case, it's much more complicated because it's a mandate. Mine is based on experience so I'm not necessarily in tune or even aware of the conversation that's been had with the directive as to why this is a good solution. So it's ... it's a bit lopsided but for your 5 cents worth and hour's worth of waiting um, I would challenge the methodology which they're using to approach this and to state as a solution, how would you ... how would you address our information needs? As an information need, this isn't a solution per say. Um, as far as maps... the thing is that some of these things... for the experience of being able to do these things is expensive because you're paying for someone to um, make a solution or manufacture one. What they're basic ally it seems like enabling you to do is sell you a template which actually shouldn't be that expensive. In fact you wouldn't need to pay for this if you... this is basically what you're doing with the host because they would have [???]

CL: Got you. Yeah, I kind of thought... I like the idea of a timeline though. That's...

K: ?? profiles of each team member.

CL: We didn't put that in. They added that.

K: Yeah, but all these things go under 'about'. Well, team goes under 'about' but 'about' ? stages that might. But those things, if I were to look at this I would say they're things that are Lewisham Creative Agency, Lewisham Creative Agency um, projects and they're typically headings you see on most pages. About the agency current projects, and news. So really under those headings that people are used to, then you can drum down to, well, the latest news is... and then you have all these links to pages on [???] and all these other things. And then under something like 'projects' then you can kind of look at a timeline of all the things that are going on. It can be that simple. But that isn't what's ? here.

CL: I think what I am learning now, and I suppose it does take time when you start in a new job, that maybe it isn't... and it is sort of... it is, what I am doing now, um, is within my experience but I am finding it quite challenging, which is good. But you know, for the first sort of few weeks, I was ... you know, if Andrew sort of challenges something and says, no I want this, I would probably... the brief for example, I'd say, okay, fine. But my ... you know, how I originally thought of the website wasn't how it is now. Because originally it was supposed to be a lot more simple.

K: Yeah. And what was ... this is interesting. So what you felt was a good solution and what someone else had experience with or wanted to see directed, there was an impasse.

CL: Ummm.

K: Okay, so how did you envision a solution?

CL: Can I just have a look at ?.... um, I think I had this, um... I mean these are all the Shirat stages which I had that would be envisioned in something. It's kind of a lot of more... this, is a lot... kind of almost in one package and a lot more visual because a lot of this can be quite visual. And that's ... basically I imagined as something quite, far more simple with sort of more... we've got some sort of great images in the area. And I think that... I envisioned it as something quite visual images explaining what we're trying to do and why we're doing it and why it's a good idea. Um, and sort of all these process stages which make sense to Andrew and myself and some of the Steering Group, would have sort of been ... I mean a lot of the ?? would have been in the background as you know, things that people could, members of the Steering Committee could download them to see, but it wouldn't have been ... there wouldn't have been all these headings and menus so... It is interesting actually to come back because there's been ... I make excuses for myself sitting there going okay, um, but because there's been a lot going on there are certain things that have just let go and just thought, well, okay, that's fine. But it's good to talk about it.

K: So whenever you feel like you know, [???] (both laugh) without going to sleep by the way, the um, [???] this is a ... oh, by the way, this isn't a ... for all intense and purposes this isn't a ? brief. What basically I will say back to you is, um, we understand what is it that you're saying and these are things that we are going to do in order to... so um, discovery phase. I am sure you don't have any problem.

CL:[???]

K: I will take care of it. The cost estimates, um, there are a couple of problems with this. Discovery phase, client meetings to discover the fine details of the project and the results will be used to draw up technical and design, a design brief. One day, that's a must. The reason being is that, well, maybe we can do it in one day. I guess I shouldn't be that way. Um, based on what your brief says, I would start [???] start over again, only because I am entirely cynical. Um, the reason why I would say the fine details of the project is that um, there you have the brief so yeah, I know that you need to flush out some ideas but I should actually send the brief back to you and say, these are the questions that we have and then, have you answered those questions, before I actually take on the project. That's what I would do before I even submit a brief to you or even say that I will take on the project. Um, design rout. So I will be presenting you with a design rout. Okay, you need... they need to add an 's' first. Design routs. It's quite rare that you'll ever have one person or you'll have a design firm give you one option period, because a) you should write into your brief that you want 3 options to pick from. Um, only because invariably you're not going to like one. You should have an option. There is no ' this is the solution for you'. There is a conversation that's possible between um, what they have and what you had initially envisioned. The conversation that is useful and actually made me kind of laugh inside was, the conversation you had with Carmichael, what you had envisioned without knowing really a good... I mean you know this per say but without knowing website design and so forth. And then the envision that he had, having either experience ? (excuse me) or capturing information. That is... that's kind of the um, communication, what I am working on in the PhD. So even though and I are having ? and you have had it with him, um, and some things to alleviate that I think would be understanding what it is that he's most interested in and excited about. And then relating to that on [???] and truly communicating almost empathetically with it because the actual tools and method that you use in order to employ it at that one time aren't necessarily that important. Um, but it's probably a good idea that he is trying to hold fast, not to the actual items because the items are actually representational, but hold onto the core idea and concept that he is holding quite close to his chest. Um, both of you I think need to do that to some degree because he's [???] from experience and you are coming into it with fresh eyes. And he needs to, to some degree, understand that there is great value in that because you do have that insight. Anyway... that kind of digresses. Um, design routs, oh well, they have routs in the title. Anyway... the client will present you with a design rout and the client will have the opportunity for ?feedback before the final artwork is completed. You need to put in [???]. You need iterations. You need to have at least iterations. These are things that I actually built into my design brief because even though you are not... the thing is that once I come to you with one or two concepts, depending on the budget, if your budget is small then I will give you two iterations

and we'll take what you choose... I am sorry. You have two concepts and then one iteration. That's how you target the [???]. um, so you choose from two concepts or what ends up happening is that I ? things from this and things from that, marry the two together, or not, and then go into a direction with an iteration. Um, you just don't want it going on forever. The other thing is that, to save two ?days, you normally do an hour in the [???] or you do one of two days, two calendar days, two weekend days, you know, two days in between. Um, it's normally, for me I feel more comfortable with the amount of hours that there are going to do it. Does this need 16 hours? Does this need, you know, the guy often does it for two hours in one day and then comes back to you two days later. It's kind of like... it can very well happen like that. um, one side development, technical and content management system page and database, [???] development, are you mad? You can ... okay. Database development, um, and I'm not trying to minimise it but database development, a lot of it is dependent on this, on the top, because basically the database is only going to hold the information that you're asking for. So this part of one day of [???] out all that information is b??. Basically you need more days on top to ensure that you're feeding the right information in the bottom. Junk in, junk out, essentially, is what you need to theorise...is the theory that you should... you should very well become adverse to. Um, technical development and content management, page 10. The thing is that they've done this before... the reason why it should take 7 days is just astronomical, um, because you do the page, put in the information, you have the headings, and then you hook up a database to the data inputs. So you have a field, you link up a database to it. It has a keying thing so you can request data from the ?backhand. Most of these things you can do in Dreamweaver. It's not brain surgery. And in fact, even if you don't do it there, you can do it through the host. You can actually do a from the host [???]. CSS theming. Wankers. You don't need that kind of... you don't need 4 days to do CSS. You do that when you're building it and then also if you have a template for the website. Then it happens. CSS is simply, you know this from Dreamweaver. It's just the coding that you do to ensure that it looks consistently. 4 days, what are you doing?

CL: [???] press button, right?

K: No. It's the colour, the type, there's format.

CL: Formatting, but you know, so everything...this block of text is all going to look like this. I like...

K: 4 days, 4 days. Okay. Blood? Testing. (both laughing) sorry, but yeah, you're not charging me for doing it right. Tweaks and amendments. Yeah, that would be go under iterations. If there...for the professionals in that you would have, in asking them to do a website... There are two parts to this. There's the professionals, in that you're going to listen based on the creative brief that you've put out. You need to redo your brief because otherwise you're going to get ?freaks. Freaks and geeks, which was a great [???] CD. I know it.

CL: That is a good point. And yeah, Raw Nerve. I don't know. They do like...

K: Why are you getting a discount?

CL: It's a golden ticket apparently. Would you like to see the golden tickets?

K: Not really.

CL: It's really pretty.

K: Context, [???] you know what? Look at the works I just put on. Did you take a look at it?

CL: Yeah.

K: And what do you think?

CL: It's... their new website actually isn't as good as their old one.

K: Okay, good. Okay. There are a couple of 4 letter words. Good is one of them. Um, and even though I am not going to make you into a designer by the time we're done, what I would like, um, what will be useful for you is that anything that you look at is ...

CL: You say more than good.

K: No. Is a reflection, does it reflect the brand? Does it reflect what we're doing?

CL: Right, okay, well, their current website doesn't reflect the brand or what we're doing.

K: Okay.

CL: But surely a good designer should be able to reflect something, many different brands? So ...

K: Yeah. A good designer should reflect many brands.

CL: No, should be able to reflect... if you're a good designer, you should be able to reflect my brand. Right?

K: Yeah, but that's... what we're having a conversation about is then and specifically not....okay, when they take on a project, their work reflects whatever your core values are, your brand and so on and so forth. When they do their website...

CL: It reflects them.

K: Yes.

CL: Yeah.

K: Okay, cool. What are we waiting for? Looks like a little bit of flash?

CL: So there we go. So ...

K: Okay, cool. Oh my god , there's [???].

CL: Yeah, he works for them, or did. He's had to go back to [???].

K: When did he go back?

CL: Really recently I think because of visa problems.

K: Bugger. RSVP.

CL: That's the website. Oh, this is the sort of, the creative headline.

K: Wait a minute. Yeah, I know RSVP. Okay, so ... okay, so this is their website. This is the website that they did.

CL: Yes.

K: Okay.

CL: So that was their... the design of Raw Nerve as their design consultancy ?selves non the Raw Nerve website and this is the RSVP Creative [???] website that they have done.

K: Okay, so they... okay, so this is... I mean this actually makes a bit of sense. Why did they respond the way that they did then?

CL: I don't know. Their... the Director, who I think is the driving force behind everything, he is the guy I have been saying to you, or who has just had a baby, and it just seems that....

K: That's really cool.

CL: [???]

K: That's very cool. Okay, so, yeah, it seems like they... cobranded online portal provides ? TV. So they did this.

CL: Yes.

K: Okay, maybe we should just click on this. I can't see [???].

CL: No there's not... no, it's [???].

K: Okay, I was impressed by the names and everything but this is starting to bother me. Um, I think ... I don't get this. The website that they did, that they did for um, RSVP, is hot. I like the website for RSVP. I am wondering what kind of direction that they got in order to do it because what they ... I don't know. Because they [???]. It looks like they do a lot of ... they do a lot of agency type um, creative group type things. It looks like they have their thing on the side and the thing on the top and the thing going on. What I kind of... I am into this.

CL: [???]

K: I'm not into... it just feels a little. There's ... what is it called? Um, Jesus, oh yeah. It's called...

CL: [???]

K: Do you think that's it?

CL: Yeah.

K: I always get ? things. Now, to be quite honest, the difference between this and ... does this work? Something, ... okay the difference between that... I am going to show you two things. One, there is a big difference between this and this.

CL: Yes.

K: Okay. This is culture clash. It's kind of cool. Archives, resident artists, artwork, subscribe, unsubscribe, so it's pretty easy. Click on it and I think you get...

CL:? Yes.

K: Issue headline information. Images. You get it all. Okay. One thing I notice and I might be wrong or I might just need [???] um, is that Raw Nerve, from what I can tell... let's take a look at this. Okay, I think I am right. It's a little bit like, this looks a little bit like ...

CL: (laughs) template.

K: So tell me why I would pay... I am sorry but I (laughs). Okay, but that's just my, just off the backhand looking at it. Um, I am a little perplexed by the um, ... it's not... if this really does represent your brand it doesn't take... it does and it doesn't take um, them to understand your brand to do something as simple as a solution. This is a very simple solution. It doesn't mean you have to do all this. I can't believe [???] all this fucked up type. Treatment. I mean the sizes, the colours, it's actually a little unnerving to be quite honest. You know what, we saw this somewhere else didn't we, this type treatment?

CL: Yeah, it's on the... yeah, there you go.

K: Okay. You know what, now, just now, unless you have creative lines over this, just no. We appreciate the work that you've done. It's ? but you need to be able to look at this critically and say, is this our brand? Because they're obviously going to do this to you. If this fits your brand, fine. You use them. But if it does not fit your brand and what you're trying to communicate you know that they have a history of doing this. Um, I personally... one of the reasons why I love to critique is that I don't have to build websites. To be quite honest, to be quite honest, I can envision all these things and I can have ... and great critiques because I can challenge things based on the knowledge that I have of their brands. I am brilliant at that. I mean I'm not just good at it. It's something that I ... it's something that I love to do. I like to... it's the conversation between um, the creative and what is needed and to ensure that there is some kind of cohesion between them. That's actually more exciting than um, the actual work, because the actual work is so boring. You just...I mean it just sucks the life out of you. Um, my website doesn't serve a function per say. It just doesn't. I wish it did but it doesn't. I am not trying to sell anything from it. It's basically for me sometimes just a creative outlet but um, some of the work that I have done is ... I mean I have worked with [???] um, ? energy. I have worked with um, you know, branding and so on and so forth. So it's... for me it's... the website isn't a matter of saying, oh I can do websites and that sort of stuff. I can but it's not really... my concern is artistic or brand oriented. It's not... it's not production in that sense. Print, yeah, design oriented and very important, but I think for you guys you may want to um... was this the only response that you had?

CL: Yeah.

K: Okay. This is the reason why I couldn't do this because your brief was just too weird.

CL: Yeah. I mean I know people that um, friends who have design consultancies but not in London and not in Lewisham which is sort of, Andrew's stipulation.

K: Oh right.

CL: So he was saying only local people, local consultancies.

K: Well, why don't you open it up to the school and say, we have a design competition.

CL: That's a good idea.

K: And um, because they're in school and at least they'll [???]. they haven't built up bad habits yet. And what you can do is then you'll have a bunch of people who um, will design it. It'll actually take you that formula for what you're asking for because you're going to have to explain it to them in baby terms. And um, then you can critically say, well, this is... and you can actually give them experience and say, this is what we're looking for. This is why this doesn't work. You have... what that's going to do and what he may be against is the fact that it will take more time. But it will actually be a case in point for investing in the area. The other thing is that you can also offer... you offer money and substantially less to that degree as a reward or as... you need... I think it should be something because of the time that they're spending and because they are in school, and as a motivating factor. In fact what you might do is offer more and have it be a group project. At least that way it will offset some of their um, some of their inclinations to have a style. [???] like the style which is [???] and totally worth ?. No, because you work for us and what you're doing is solving an issue. You're not [???] your style onto us. So um, that's one option is to open it up that way. The other thing is, who do I know that ... what is Creative Lewisham? The paper that I wrote is talking about the dichotomy of Creative Lewisham, its economic stimulus and the inherent creativity that's ignored? Within an area. So um, haha, um, oh, ...

CL: I didn't put 2 and 2 together.

K: What?

CL: He doesn't know that you ... he didn't mention.

K: Yeah, within the realm of possibility it's probably nothing important to him. I can't imagine that it would be. I may have met him once but I doubt it. I really kind of doubt it. He may have and talked and ...

CL: He probably did a ...

K: That's just a ... I don't think I was there when he gave his talk. Um, I think he may have been in the same place as I was for something. But... um, I would like to stay involved, I mean even if you need someone to advise you and give you feedback.

CL: That would be great.

K: I think that would be cool. I would love to, because it gives me creative director type thing. I was a consultant in the creative direction. Um, that I am good at doing. (phonecall for CL) If you guys needs a role for that that would be fine.

CL: That would be great.

K: Yes. If you go... I don't know. I should charge you guys. I'm just kidding.

CL: If we had millions, you could have them.

K: But I do think, um, how long are you guys doing this? This should only be 6 weeks right?

CL: The...

K: This ..

CL: This project. No, the planning phase, the actual event's in June.

K: So you're talking like a month. You should have it out then, being able to use it like, pretty soon. The school thing makes it difficult then because you're going to have school in addition to this.

CL: Yes, and holidays very soon.

K: Yeah, spring break. Okay. So ...

CL: The school's a really good idea. Yes, because we do need it up and running quickly.

K: Maybe... okay, and you haven't had anyone else?

CL: No, no one.

K: Jesus Christ. Aren't there a bunch of creative, like design things?

CL: RSVP didn't bring up much and Bridget was sort if like, oh well, we've got these, but none of them can do it.

K: No.

CL: No.

K: Okay. I would redo your...

CL: Redo the brief.

K: Redo the brief. And um, if you feel inclined, show it to me and I will give you some... actually you know

what? Um, what I might ... what I might well do tonight is [???] what I do as a creative brief. And then those are the questions that I ask my clients before I take on a project. And then um, what you can do is maybe incorporate some of those things in a ... I ask about audience, I ask about brand, ask about, you know, where they see themselves. These are more branding things than anything else. But some of the relevant ones like, you know, what is the function of this? Who do you hope to reach? What do you hope to achieve with it? They'll narrow down your brief a little bit and yeah, some of the menu items you may want to take out and really kind of summarise as the information that we hope to capture will reflect such and such. Um, and decide where he still sees [???] that the details are in there but in a way that someone else will understand. We're going from very very logistic and quantitative information to you know, a brief, which is really... this is our problem. This is what we need. It should be like that, not , when you tell them what it is that you want, I saw... I could see that it wasn't going to be a project that I could do. I can't do this because you're already kind of tying me to these stipulations when design is opportunity of finding our fact finding exercise. Idea? As I am concerned with is already narrowed down anyway. It'll be narrowed down by your brand. It will be narrowed down by your messaging, by the colours, by the colours, by the language. All those things are already set out and you need to be aware that they are there, and then a designer can come in with a level playing field and what they understand. Otherwise the designer has to come in, establish these things with you, elicit them from you, which means that it takes more than just a day. You know, it takes like 3 days um, for you to know yourself, because this ends up being as opposed to just an exercise for the website, it becomes an exercise of understanding your brand, if they are good designers. Because if they make a website like this for you that has nothing to do with you, it will be giving you more harm than good as far as visibility and PR.

CL: [???]

K: And that kind of stuff is hard to indicate?

CL: Yeah, it's ... yes. It's made me realise just how many holes there are in this, not in a bad way. They can easily be filled up and... but yeah, I think I need...you know when you sort of need to just stop and take stock of things and understand [???] not in a ...

K: Non-confrontational but reassuring and this is actually the reality of it. Or this is your reality as you see it. One thing that will help, um, what's always helped designers or what's always helped me is to have examples. So for you I would arm yourself with an example of a timeline that you see working on the website, b) it a website that you find is useful, c) an example of um, Creative Lewisham, where the colours and the things are well used and inter? Oriented. And then by those things you can justify your vision to whichever designer you decide to go with. It would be... what was a passing thought for me was to actually have um, if I were a part of maybe two other people, one who is actually doing the designing, who puts together the website and just writes the code, and then [???] need to be able to translate and communicate that to him, what it is that you actually need. That would be a perfect fit for me because I really cannot be assed to build the website. I just ... I just, you know, maybe that will change in a month [???] but as I see it now um, it would just ... it would break my heart.

CL: [???]

K: ? logic. I shouldn't be so dramatic. I am just so tired. My flatmate was like, Kevin, why aren't you doing this? Why am I not doing this? Why do you think? I am going on vacation. You know when you just need a break. You just need it. You just...

CL: We should stop soon.

K: Yes. Start logic. If you can have a look at their site, they have... they allow you to build forms and whatever else through the website. So what may end up happening is that you simply need to figure out which forms will and won't work and so on and so forth and do it that way. And basically all you need is some creative direction to tailor them to your needs.

CL: Okay.

K: So it's kind of like the ... it's the easy out without getting stuck with um, all these other things. So keep that in mind.

CL: Great. Thank you.

K: That's kind of the quick and dirty way.

CL: That's been really helpful.

University of Glasgow for the 7th annual Conference of the Graduate School of Arts and Humanities entitled Communicating Change: Weaving the Web into the Future.

Title: How can designers develop communication that effectively addresses 'wicked problems' in design?

The process of examining a brief for an environmentally sustainable car and the explicit and implicit goals of the car will be useful to illustrate how communication can be developed and result in a more effective method for addressing 'wicked problems' can occur. NPR[2] has reported in the US during 2008 and 2009, a huge push by the Obama administration for the manufacturing of 'green' cars or cars that produce less carbon emissions. This push for an environmentally sustainable car is an example of a 'wicked problem' and provides a sample design brief to explore in this paper within the context of developing communication when faced with 'wicked problems.'

The environment and society benefit when design[3] functions more effectively as a solution finding process. The pursuit of solutions to 'wicked problems' could result from balancing contexts of human welfare/well being[4], environmentalism and capitalism. Currently, this proposition is problematic since design has functioned and continues to be perceived as a revenue generating exercise for business. Landry's 'creative city' is an example of how creativity and innovation[5] have become centerpieces of strategic business plans since the 70's[6]. Environmentally conscious design methods and environmental/socially ethical design ethos exist and have been written about extensively. Richard Buchanan's *Human Dignity and Human Rights: Thoughts on the Principles of Human-Centered Design* (2001), E. F. Schumacher's *Small is Beautiful* (1973), Papanek's *Design for the Real World* (1974) and Victor Margolin's *Design for a Sustainable World* (2001) are a few examples. Along with Donald Schön and Nigel Cross designers are providing significant design examples that environmental and ethical design are not only possible but necessary. While some distinction can be made between human welfare/well being, environmental and capitalistic approaches, a further distinction can be made of the intentions recognized within popular culture. Eddie Izzard for example has commented that 'the difference between capitalism and 'creativism' is that creatives make money so they can create things while capitalists make things so they create wealth[7]. Design as an act of 'creativism' could be a method employing human interaction and enacting considered or wise choices in balancing the contexts human welfare/well being, environmentalism and capitalism among others.

A relationship between creativity and sustainability was recognized in 1995, by the World Commission on Culture[8]. They reported that creativity and sustainability are not only compatible but they are both necessary

2 Joyce, C. (2008), Memmott, M. (2009)

3 'No single definition of design, or branches of professionalized practice such as industrial or graphic design, adequately covers the diversity of ideas and methods gathered together under the label.' (Buchanan, 2001 pp. 5)

4 Subjective well-being (SWB) or empirical research comparing societies '- people in them evaluate their lives in positive terms.' (ed. Diener and Suh, 2000 pp. 3)

5 Innovation has become the catchword of the present period. Innovation is the driving force behind the dynamics of industrialized societies. It has become an almost universal imperative, in spite of the warnings of environmentally concerned people who doubt that the industrialization paradigm of the last 250 years can survive without drastic modification. It would be wrong to call this drift toward innovation an objective historical force because, after all, innovation depends on the resources that a company or economy allocates to this particular form of action. It is well known that innovation is, to a considerable degree, a question of investment. Science is embedded in a system in which technology and design occupy a no less central position. In order to support this declaration, the relationship and interaction between these three different types of innovation must be established. Most authorities concerned with defining a policy for scientific and technological development do not realize that science, technology and design are interrelated: without design, the objectives of science and technology policies cannot be attained. There is a consensus today that science and technology are connected, though it remains to be shown that science comes before technology, or that technological innovation is a direct outcome of scientific research.

6 Blau and McKinley (1979)

7 Eddie Izzard (2009)

8It also gave strong emphasis to the state of the environment, supporting 'the idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs' (Our Common Future, p 43). The emphasis on the social and cultural factors of development was further amplified in 1995 when the World Commission on Culture and Development, a group established by UNESCO, introduced its own report, Our Creative Diversity. (Margolin 2007 pp. 112)

for addressing environmentalism, a ‘wicked problem.’ Sustainability as it is described in the report by the World Commission on Environment and Development (1987), widely known as the Brundtland Commission (after its chairperson) was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs"'(Arrow et al., 2004 pp. 150). Creativity like sustainability has seen its definition change. Definitions of creativity have become more business centered conveniently ignoring historically and epistemologically intended meanings. Creativity in particular can be ill-defined and perceived as unique and an enigmatic within the arts. Creativity has also been defined in a product marketing or business context[9] by the ability to generate an appropriate design outcome[10]. The current definitions can result and contribute to counter productive methodologies and strained perceptions of solutions especially where ‘wicked problems’ are concerned. I base my definition of creativity on the works of David Bohm, a world theoretical physicist, philosopher and writer on creativity and Paul Kristeller[11], a historian and philosopher. Creativity for this paper within the context of developing greater design outcomes and considered possibilities will be defined as ‘the ability to make something novel as a result of the designer’s activity whereby drawing on memory they take a risk that cannot be anticipated by planning’. This definition allows creativity to be more than an intangible and subjective characteristic. With this definition of creativity, designers can address ‘wicked problems’ by using a creative method to develop novel solutions that will not compromise the ability of future generations to meet their own needs.

Two issues, within this paper, related to how communication can facilitate design as a more environmentally effective practice are raised from the brief of designing an environmentally sustainable car. The first issue is communication between the client and the designer. David Bohm[12] noted that communication is breaking down worldwide on an unparalleled scale, including design. The second issue is that Peat and Bohm[13] have also stated that creativity can be facilitated by dialogue. Currently creativity has been redefined in such a way that design outcomes are so closely aligned with the design brief that the outcome is now a definition of creativity. As an outcome new definitions of creativity can inhibit the formation or consideration of novel solutions[14]. Long-term affects include creatively crippling the designer and contributing to a tunnel vision of developing artefacts when in fact like in the case of the environmentally sustainable car, such a solution may not be environmentally sustainable.

It is from this perspective I propose that changes in communication during the ideation phase can significantly impact the design process. The design brief for the environmentally sustainable car is a communication problem. The design brief should inspire a lively communication regarding what the client and the brief really mean at each step. Communication and creativity are critical if we are to break through this cycle of rhetoric and displacement of environmental issues as secondary to economy. This statement is based on what may be considered the limited responses the designer may be able to propose as solutions to the question ‘Can you design an environmentally sustainable car?’ The answer if it is no, is out of the context of the design brief and if

9 '"It is important to argue that design must be managed and that design can be managed."' There is considerable misunderstanding on both points. Some managers believe that design is something outside normal business practices and does not benefit from being managed. Other managers believe that design would benefit from being managed but due to creativity and other uncertainties is regrettably unmanageable. In fact, design has to be managed just as much as anything else, and the uncertainties that are involved are no more serious than the uncertainties inherent in any other task within industry that has to be managed, for example, commissioning a new factory or exploiting a new market.' (Clipson, 1992 pp. 218)

10 'Creativity has been usually defined as a person’s ability to produce a novel and appropriate product (Lubart, 1994; Sternberg and Lubart, 1996; Amabile, 1997; Sternberg, 2001).' (Kim, M. H. et al, 2007 pp. 585)

11 Kristeller 1983, pp. 111

12 'During the last few decades, modern technology, with radio, television, air travel, and satellites, has woven a network of communications which puts each part of the world into almost instant contact with all other parts. Yet, in spite of this world wide system of linkages, there is, at this very moment, a general feeling that communication is breaking down everywhere, on an unparalleled scale.' (Bohm, 2007 pp. 1)

13 Bohm, D., Peat, David F. (2008)

14 '…research in creativity suggests that focusing on existing examples may inhibit the generative process when the goal is to create a truly innovative product (Jansson and Smith 1991; Marsh, Ward, and Landau 1999; Ward 1994).' (Dahl and Moreau, 2002 pp. 50)

the answer is yes, is this truly as we know it a solution?

Design, as a discipline, field of study and practice has changed from the hands on approach of the Bauhaus[15] where the value placed on materials, play and ethics were creatively combined. The manner of exploration has been replaced by strategic moves and business models.

A possibility of what it can change into as a method of solution finding should include effective communication. Communication changes could evolve design methodologies from a business context or a creative context and contribute to a new design context of solution finding. The business context within ideation emphasizes the role of the designer may to generate ideas based on the design parameters, which is a common practice and in fact is a popular method of evaluating creativity. Within the context of this paper and developing solutions for an environmentally sustainable car, the more narrowed view of creativity is no longer adequate. Clients and designers cannot ignore their impact or that of their designs within society and the environment. As it relates to design, what do I mean by communication? Specifically, I recall David Bohm's idea of dialog.

> ''communication' is based on the Latin commun and the suffix "i.e." which is similar to "fie," in that it means "to make or to do." So one meaning of "to communicate" is "to make something common," i.e., to convey information or knowledge from one person to another in as accurate a way as possible.' (Bohm 2007 pp. 2) 'Thus, in a dialogue, each person does not attempt to make common certain ideas or items of information that are already known to him. Rather, it may be said that the two people are making something in common, i.e., creating something new together.' (Bohm 2007 pp. 3)

Dialog as defined by David Bohm is not an attempt to make common certain ideas that are already known but that two people are making something in common and new together[16]. This type of dialog can be incorporated into an ideation methodology that allows design ideation to be a more effective and creative method of addressing 'wicked problems'. What is free to occur through dialog is an exploration of possibilities and that is a major difference between design communication and design dialog.

Design can function effectively as a method of uncovering solutions between the two major philosophical ideologies within our post-industrial society[17]. Pragmatism or 'a principle of method for estimating the practical value and results of philosophical conceptions' (Bawden, 1904 pp. 422) can be used to represent business and existentialism 'or the extreme attempt to find a meaning in the existence of modern man whose philosophy and science originated in the will to make himself, through knowledge, the master of the world…' (Beck, 1944 pp. 127) can be used to represent the phenomena of creativity and the coming into being that takes place during the design process and in particular the ideation phase. This step of incorporating other contexts would be aided by communication and changes in methodology to work correctly. Clients within our pragmatic post-industrial society would like value for money and have invested large amounts of money in research for new and exploitable markets. A designers response that an environmentally sustainable car is "not possible, and that exploring a world without cars is necessary" is still considered unacceptable by the Obama administration and the American people. This reaction does not substantiate a continuation of design as an economic tool. The designer and the client are environmental stakeholders and should be socially equal participants within the design process. Design has a unique role in balancing both the pragmatic or practical/business expectation and the pursuit of meaning, knowledge and our role in the world around us.

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15 'In general, the course was intended to "release the creative power of the student" (Moholy, The New Vision, p. 20), and became more and more consciously directed to this end, excluding the usual emphasis on teaching retainable knowledge or particular skills. The approach employs no specific means or procedures to follow. The student is not required or encouraged to produce "premature practical results" (Moholy, The New Vision, p. 21). Instead, he is offered an opportunity to experiment freely with various materials and tools. There is a strong emphasis on initiative within a "do-it- yourself" set-up, using conventional and unconventional means, often achieving strikingly new and strange configurations.' (Bredendieck, 1962 pp. 16)

16 Bohm, 2007 pp. 3

17 '…it can be said that in the world of so-called industrial society there are exactly three philosophies that really function… Marxism, Existentialism, and Pragmatism.[1]' (Apel, 1981 pp. 1)

If current trends persist as Nigel Cross has stated we will pursue a more technological method of design and possibly more technologically dependent. This is not a simple good or bad scenario. Within ideation it can be limiting. Technology can be developed around that which can be repeated, predicted and probable. Technology is not as able in dealing with the phenomenological in fact even though our cultural philosophy may reflect existentialism we in fact are very pragmatic, failing to see the journey but constantly looking towards the ends and for the means to justify the ends. This eludes to one major problem and that is the outright rejection of reality. In that our methodology within design must reflect reality and not merely our intentions.

Design, a human function, relies heavily on doing and process. Design can bee seen as 'a two-way relationship between a reality to design (in our case the environment) and its model.' (Chiapponi, 1998 pp. 78) Design is well suited to address 'wicked problems' as the parameters and complexities cannot be technologically mapped or predicted. When design effectively utilizes dialog in developing creative solutions complexity can be better engaged and more creative ideas can be elicited by the client and designer. The designer's ability to transcend contextual and philosophical dualisms that have plagued more uniform theories of knowledge between existentialism and empiricism[18] a key to how it can provide solutions.

Our biggest obstacles as societies within the post-industrial society are ourselves and our mental habits. Within Western culture, we have actively and passively participated in selling and exporting an unsustainable way of living. Communication must evolve to effectively incorporate creativity and business in order to address 'wicked problems' and not as a mere issue of generating revenue. Design outcomes can not be adopted solely within the context of commerce where the rules of environmental engagement have long been a matter of marketing and increased revenue instead of developing solutions within growing economic ambition. New design methodologies, dialog and outcomes must also include that cars are not the answer and that there is a future without them and that the designer is tasked with envisioning that future.

18 If there is an unresolved dualism of questioner-and-nature in the professed monism of the empiricist, its difficulties do not become apparent as long as the questions are asked of nature. The canons of induction-deduction hold good: data, induction, hypothesis, deduction, test, verification, prediction, planning. But as soon as the data comes to comprise not the physical world or subhuman biology but other questioners, others existents, the empirical method finds itself in certain notorious difficulties. (1) The imperialism of the social sciences. As long as there is one datum man and several disciplines, each professing a different irreducible - i.e., cultural unit, libido, social monad, genetic trait - there is bound to result a deordination of the sciences of man with each claiming total competence and each privately persuaded that the other is pursuing a chimera.' (Percy, 1956 pp. 522)

Survey Monkey "How do you come up with ideas?" - http://www.surveymonkey.com/s/NBSSSQ5

The survey was distributed online from February 16th to March 6th 2010 with 25 respondents

What is your job title(s) and what company(ies) do you do it for?

1. Tax Adviser, Ernst & Young
2. design consultant, consulting to international industry
3. ACS Ready Reserve Delta Airlines
4. writer, editor & communications specialist; self-employed
5. Office Manager for Crate & Barrel
6. high school chemistry teacher, public school district (us)
7. Branding strategist for branding consultancy Wolff Olins
8. Postdoctoral Research Assistant in Queen Mary University of London
9. Teacher for Great Falls (Montana) Public Schools
10. I am a student teacher and graphic designer. I have worked for many design firms and am now teaching art and design at Service High School in Anchorage, AK.
11. tech rep for Tremco WTI
12. Post-doctoral researcher, for Plymouth Marine Laboratory
13. Materials Science and Systems Engineer, for Aerojet a branch of the GenCorp.
14. Senior Buyer Balfour Beatty Civil Engineering
15. doctor, NHS
16. Senior Associate Scientist
17. Retoucher (self employed), Technician (Goldsmiths Design Dept), Office Manager (Goldsmiths IT Services)
18. Consultant - IMS Health consulting
19. I am a freelance architect, working mainly with private clients but also with local architectural practices
20. Analyst, Blackrock
21. test
22. Swim Coach; London University Swim Team
23. Information Architect, Microsoft
24. Currently - unemployed. No tools.
25. Graphic Desiger, Art Director - Modern Dog Design Co.

Did you take part in the design research activity testing ideation tools?

Yes 24.0% - 6 respondents

No 76.0% - 18 respondents

0 skipped

How would you describe ideation?

1. The method by which a designer comes up with an idea - but I do not know this for sure
2. tools which help think through (and around) concepts, and generate ideas
3. The process of creation of new ideas
4. Generating ideas
5. A generation of ideas or thought processes that further an existing thought or solution.
6. not sure yet! it's still a vague concept for me...
7. Generation of ideas
8. not really sure, It sounds to me like the process of developing a solution for a given problem from analizing the problem to be solve to the assessment of its suitability
9. I don't know what ideation is.
10. Ideation is to me taking bits and pieces of everyday thoughts and putting them together in a unique way like a jigsaw puzzle.
11. the ability to form an idea
12. No idea
13. As the creation of ideas, a process.
14. a new way of approaching an existing method of practice
15. GENERATE NEW IDEAS
16. Coming up with ideas?
17. the process of generating ideas
18. The process of creating ideas
19. Generating innovative thinking through collaborative exercises across disciplines
20. interesting but difficult
21. test
22. An idea that comes to being?
23. Not sure, only seen the IBM ad

24. I wouldn't even begin to know what it is.

25. Coming up with a good idea.

0 Skipped

If ideation is defined as a method of developing and generating ideas, either visual, verbal or written, how would you rate the importance of ideation during your problem solving process?

1 (no, it's not important at all)		
2		
3 (inconvenient, but i may do it)		
4		
5 (can be beneficial)	4.3%	1 respondent
6		
7 (very useful)	26.1%	6 respondents
8	17.4%	4 respondent
9 (critical to the problem solving process)	52.2%	12 respondents

2 Skipped

Do you ideate the most alone, with a group or both?

Alone	21.7%	5 respondents
Group	0.0%	0 respondents
Both	78.3%	18 respondents

2 Skipped

Do you use ideation tools during your practice? (i.e. brainstorming, mind mapping, sketching, building)?

Yes	87.0%	20 respondents
No	19.0%	4 respondents

2 Skipped

Do you use ideation tools during your practice? (i.e. brainstorming, mind mapping, sketching, building)?

Does not apply	8.7%	2 respondents
never	13.0%	3 respondents
sometimes	34.8%	8 respondents
all the time	34.8	8 respondents
no clue what you are talking about	8.7%	2 respondents

2 Skipped question

What ideation tools, if any do you use with your clients?

1. Don't tend to use them with clients for creating an idea in a meeting usually. We take a list of ideas already thought up so that the client knows that we have considered ideas beforehand and prepared. If we need to come up with ideas on the spot then typically use illustrative examples including diagrams and figures.
2. none, only with colleagues and student
3. Don't use themselves
4. NA
5. I give customers options/solutions that are within set guidelines dictated by the company that I work for.
6. see question 4
7. Workshops (task driven and prompted with pre-prepared stimulus), brainstorms
8. brainstorming, sketching, work flow charts, decomposing problems in simpler problems (moduls) to be solved, (not apply to client but to my own work)
9. I usually talk over thoughts that I have for a project with them and hear what they have to say afterward. Then we come up with a positive compromise that pleases both parties.
10. Na
11. None
12. Brainstorming, fish ladder, FMEA, sketching
13. DON'T KNOW WHAT YOU R TALKING ABOUT

14. none
15. brainstorming, sketching, discussion & probably some more that I'm not aware of
16. don't use any
17. Discussion, diagrams, images, 3D objects
18. non
19. test
20. brainstorming, idea boards
21. I would, based on the above, classify modeling tools in this category and they are crucial to my job.
22. I don't have clients....
23. Drawing, sketching, looking through old books, reading the news, listening to music.

2 Skipped

If there was an ideation tool designed to help you generate ideas with the client would you use it?

Yes	91.3%	20 respondents
No	8.7%	2 respondent

2 Skipped

What are, if any, reservations you might have for using and ideation tool with a client?

1. Personally I would like to use ideation technology but I know that clients are unlikely to embrace such an approach unless we used it to prepare for a meeting (instead of using it together in the meeting). This is because they might perceive us as not being well prepared or technically sophisticated, especially if competitors did not use.
2. a tool which helps the client define the brief more clearly may work, subject to how it is done
3. I would want to test it in a non-client atmosphere, like a training session before using it with a client.
4. The time it might take versus my current processes
5. There would have to be a way of setting very specific limits to the choices and options that I would be able to offer a customer. It would also have to take into account the dollar amounts and merchandise options that customers could realistically expect from our company.

6. it's applicability to education, and understanding how children are thinking about the problems they are expected to solve. and of course, using a problem solving tool to figure out how to teach those problems best to my kids.
7. No reservation if the tool is simple and relevant to the particular issue being addressed
8. Sharing ideas in my work field may turn up in losing the privilege of further work on that idea
9. Only if it complicates the process too much and adds more work to the project then necessary.
10. Na
11. You'd have to be very clear about which ideas were possible to implement, and which were not.
12. That it might be too broad to use for my business
13. DON'T KNOW
14. Do not work with clients
15. time costs, extension/significant modification of initial brief without client realisation of extra costs that this may incur.
16. Falling into the trap of 'cookie cutter' solutions
17. My Phd argues that it is paramount to any future creative enterprises. My only reservation is that it risks remaining isolated from the greater picture:- clients usually stick to their vested interests in the end...
18. it might look like I don't know what I'm doing if I need a tool to create ideas with the client
19. test
20. not enough creativity to building something new and innovative
21. none
22. Knowing the ideals of the person behind the ideation tool... they may be "pro-choice" and if I'm working with a "pro-life" group - the ideals and morals of the person creating the ideation tool might effect its usability.
23. Not sure. Maybe too specific. It would need to be open ended.

2 Skipped

i 'The prime minister today scrapped the two-year-old Department for Innovation, Universities and Skills, and awarded all of its responsibilities to a new Department for Business, Innovation and Skills designed to help the UK out of recession. The new department, which will be headed by Lord Mandelson, puts universities at the heart of the government's business policies, and will be opposed by some academics who believe higher education should be in a department dedicated to education and not commerce. In a statement, Downing Street said the move would create a "single department committed to building Britain's future economic strengths". It went on: "It also puts the UK's further education system and universities closer to the heart of government thinking about building now for the upturn." (http://www.guardian.co.uk/education/2009/jun/05/mandelson-to-run-universities)

ii Necdet Teymur has argued, "by failing to distinguish the multiple content of the term 'design' ... (and) by dumping the whole sets of distinct activities and action under one 'act,'"9 design history only further obscures the immensely complex and varied division of labor at the basis of the design activity. A surface variety then obscures a real variety of activity and processes. (Dilnot 1984, pp. 4)

iii Nathan Glazer has called the “major” professions of medicine, law, and business, along with such “minor” professions as social work, education, and town planning, are based on an epistemology of practice embedded in the modern research university where these professions established their schools. On this view, professional competence consists in the application of systematic professional knowledge – at best, scientific knowledge – to the instrumental problems of practice.

iv 'Cache calls his book a "classifier of images." But what is an image? What does it mean to understand image in terms of a space that is prior to representation? An image is not a picture. It is not a representation or an imitation of an external object, and we must therefore get away from the Platonic view that connects seeing to essential forms, as well as from the Cartesian variant on this view in which an image is conceived as an internal or mental picture of an external object. Cache envisages instead a universe where objects are not stable but may undergo variations, giving rise to new possibilities of seeing.' (Barnard 1995, pp. ix)

v 'For a large part of its history cognitive science has been grounded in views of the mind based on the traditional Cartesian dualisms. These dichotomies have been reinforced in particular by the view of the mind as an encased symbol-processing system “protected from the external world” (Newell, A., Rosenbloom, P. S., & Laird J. E. (1990).' (Lecusay et al. 2007, pp. 2)

vi Complex systems consist of a large number of elements. When the number is relatively small, the behaviour of the elements can often be given a formal description in conventional terms. However, when the number becomes sufficiently large, conventional means (e.g. a system of differential equations) not only become impractical, they also cease to assist in any understanding of the system.

vii A. Complex systems consist of a large number of elements. When the number is relatively small, the behaviour of the elements can often be given a formal description in conventional terms. However, when the number becomes sufficiently large, conventional means (e.g. a system of differential equations) not only become impractical, they also cease to assist in any understanding of the system.

B. A large number of elements are necessary, but not sufficient. The grains of sand on a beach do not interest us as a complex system. In order to constitute a complex system, the element have to interact, and this interaction must be dynamic. A complex system changes with time. The interactions do not have to be physical; they can also be thought of as the transference of information.

C. The interaction is fairly rich, i.e. any element in the system influences, and is influenced by, quite a few other ones. The behaviour of the system however, is not determined by the exact amount of interactions associated with specific elements. If there are enough elements in the system (of which some are redundant), a number of sparsely connected elements can perform the same function as that of one richly connected element.

D. The interactions themselves have a number of important characteristics. Firstly, the interactions are non-linear. A large system of linear elements can usually be collapsed into an equivalent system that is very much smaller. Non-linearity also guarantees that small causes can have large results, and vice versa. It is a precondition for complexity.

E. The interactions usually have a fairly short range, i.e. information is received primarily from the immediate neighbours. Long-range interaction is not impossible, but practical constraints force this consideration. This does not preclude wide-ranging influence – since the interaction is rich, the route from one element to any other can usually be covered in a few steps. As a result, the influence gets modulated along the way. It can be enhanced, suppressed or altered in a number of ways.

F. There are loops in the interactions. The effect of any activity can feed back onto itself, sometimes directly, sometimes after a number of intervening stages. This feedback can be positive (enhancing, stimulating) or negative (detracting, inhibiting). Both kinds are necessary. The technical term for this aspect of complexity is recurrency. Complex systems are usually open systems, i.e. they interact with their environment. As a matter of fact, it is often difficult to define the border of a complex system. Instead of being a characteristic of the system itself, the scope of the system is usually determined by the purpose of the observer. This process is called framing. Closed systems are usually merely complicated.

G. Complex systems operate under conditions far from equilibrium. There has to be a constant flow of energy to maintain the organization of the system and to ensure its survival. Equilibrium is another world for death.

H. Complex systems have a history. Not only do they evolve through time, but their past is co-responsible for their present behaviour. Any analysis of a complex system that ignores the dimension of time is incomplete, or at most a synchronic snapshot of a diachronic process.

I. Each element in the system is ignorant of the behaviour of the system as a whole, it responds only to information that is available to it locally. This point is vitally important. If each element ‘knew’ what was happening to the system as a whole, all of the complexity would have to be present in that element. This would entail a physical impossibility in the same sense that a single element does not the necessary capacity, or constitute a metaphysical move in the sense that ‘consciousness’ of the whole, our focus shifts from the individual element in the system to the complex structure of the system. The complexity emerges as a result of the patters of interaction between the elements.’ (Cilliers 1998, pp. 3-4)

viii Chiapponi describes complexity as systems composed of different components; each component has diverse functions within the

system; the individual components and functions are both connected and, at times contradictory; and, everything cannot be explained in terms of components, functional structures, and reciprocal relationships (Chiapponi 1998, pp. 77)

ix 'The distinction between project-orientated design research and the scholarly area of design studies reflects the extension of design from a form-giving activity to an interdisciplinary process dealing with complex systems and solutions.' (Roth 1999, pp. 19)

x 'Design must be involved in issues more complex than social entertainment.' (Storkerson 2008, pp. 5)

xi 'A designer makes things. Sometimes he makes the final product; more often, he makes a representation - a plan,, program, or image - of an artefact to be constructed by others. He works in particular situations, uses particular materials, and employs a distinctive medium and language. Typically, his making process is complex. There are more variables - kinds of possible moves, norms, and interrelationships of these - than can be represented in a finite model. Because of this complexity, the designer's moves tend, happily or unhappily, to produce consequences other than those intended. When this happens, the designer may take account of the unintended changes he has made in the situation by forming a new appreciations and understandings and by making new moves. He shapes the situation, in accordance with his initial appreciation of it, the situation "talks back," and he responds to the situation's 'back-talk.' (Schön 1991, pp. 78-79)

xii 'The essays must speak for themselves, but here at the beginning let me state my belief that such matters as the bilateral symmetry of an animal, the patterned arrangement of leaves in a plant, the escalation of an armament race, the process of courtship, the nature of play, the grammar of a sentence, the mystery of biological evolution, the contemporary crisis in man's relationship to his environment, can only be understood in terms of such an ecology of ideas as I propose.' (Bateson 1973, pp. 21)

xiii 'It is argued that underlying the Church-Turing hypothesis there is an implicit physical assertion. Here, this assertion is presented explicitly as a physical principle: 'every finitely realizable physical system can be perfectly simulated by a universal model computer machine operating by finite means'. (Deutsch 1985, pp. 97)

xiv In Republic VI, Plato divided the objects of knowledge into two realms: the visible and the intelligible (see Plato §14). He considered the former to include the objects of the senses, about which only opinion but not genuine knowledge is possible, and the latter to include geometry and astronomy, in which investigators assume the existence of their objects (such as geometrical objects) and reason from them as from hypotheses. In the highest reaches of the intelligible realm, reason attempts to reach 'the first principle of all that exists', from which it then 'comes down to a conclusion…proceeding by means of Forms and through Forms to its conclusions which are Forms', without any reference to the visible world. Plato conceived the sensible world as a dim reflection of the intelligible Forms, and he held that the Forms themselves are best known through direct intellectual contemplation, independent of sensory experience. The notion of an intelligible world behind the sensible world, and especially of a world described by mathematics, has played an important role in physical science since Plato's time. (Hatfield 1998, pp. 1)

xv The theory of chaos also represents solid mathematics, which in this case has a long history researching back to Poincare.[10] Chaotic systems are deterministic dynamic systems that, if their initial conditions are disturbed even infinitesimally, may alter their path radically. Thus, although they are deterministic, their detailed behaviour over time is unpredictable, for small perterbations cause large changes in path.' (Simon 1996, pp. 176)

xvi Despite the exaggeration and simplification that is involved in the revelation of any complex truth, it can be said that in the world of so-called industrial society there are exactly three philosophies that really function. By this I do not mean just that they are advocated, but that they in fact mediate between theory and practice in life. These philosophies are Marxism, Existentialism, and Pragmatism.1 (Apel 1981, pp. 1)

xvii Instead of yielding productive integrations, the result is often confusion and a breakdown of communication, with a lack of intelligent practice to carry innovative ideas into objective, concrete embodiment. (Buchanan 1992, pp. 8)

xviii 'We think of things as if they were autonomously behaving parts that could be separated out and then put back into interaction. Undivided wholes do not fit this pattern.' (Riches 2000, pp. 669)

xix 'period of incubation', with its frustrations, tensions, random tries, and false inspirations, corresponds to the critical periods of 'fertile anarchy' which recur, from time to time, in the history of every science. These crises have, as we saw, a destructive and a constructive aspect. In the case of the individual scientist, they involve a temporary retreat to some more primitive form of ideation - innocence regained through the sacrifice of hard won intellectual positions and established beliefs; in the case of a branch of science taken as a whole, the crisis manifests itself in a relaxation of the rigid rules of the game, a thawing of the collective matrix, the breakdown of mental habits and absolute frontiers - a process of reculer pour mieux sauter on an historic scale. The Eureka act proper, the moment of truth experienced by the creative individual, is paralleled on the collective place by the emergence, out of the scattered fragments, of a new synthesis, brought about by a quick succession of individual discoveries - where, characteristically, the same discovery is often made by several individuals at the same time (cf. p. 110f). (Koestler, 1969, pp. 225-226)

xx 'As he says, "Like the symbol, abstraction came into being with the beginning of art. It existed: nameless. It was simply there..." Certainly these two agencies, symbol and abstraction, have a powerful resonance in any situation we speak of as "creative," or surely they have had. To take from that, to make another - this must, in thinking, be an extraordinary act of mind - to have of another a one, itself thus thing of the other, symbolic, and yet apart, abstract - so becomes the magic we feel in all transformation. Initially, as Giedion assumes it, there were two possibilities in abstraction: the ability to make all the seemingly endless divergecncy and occasion

of thing a general agreement, a one in which the all of it s situation might come to rest and be recognized; but also, the impulse to have the one be a part of the whole, in a way which overrode it, because specific more intensely than all the other "parts" otherwise equally present, an "i" that wants so much more than to be merely "human" or "people" or, simply, "like them." Giedion notes that there is an increasing social egocentricity in that time between the Middle Ages and the Renaissance, although it is myself who calls it "socia" - a feeling that what the elders our own time felt as "individual sensibility," an insistence on the intrinsic value of what each one of us may feel, think, or value as singular persons, was growing in multiple social senses at this time. Giedion also emphasizes that it is this same dominance of egocentricity that permits Descartes to say, "I think, therefore I am," and to make thus separation of emotion and intellect in the context of human experience. The abstraction here accomplished is of the second kind.' (Creeley 1974, pp. 1030)

xxi 'In the two management reviews (Damanpour 1991, Zammuto & O'Connor 1992), two important themes about the determinants of innovation have emerged, namely, the importance of an organic structure (Burs & Stalker 1961) and pro-change values or high-risk strategies.' (Hage 1999, pp. 601)

xxii 'The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers goods, the new methods of production or transportation the new markets,.... [This process] incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism.' (Aghion and Howitt 1992, pp. 324)

xxiii'The abilities that we have in the way of memory and imagination, of symbolism and emblem, are all conditioned by the sense of sight. It is sight which dominates this kind of sequence, how we think of things that appear in the mind. And when I come back to saying "visual," "vision," and "visionary"; "image," imagery," "imagination," Now imagination is a much less mechanical gift than that of the eye as I have described it. But because it is squarely rooted in that, it is an ability which human beings posses and which no other animal shares with them.' (Bronowski 1978, pp. 18)

xxiv Moixa Energy Holdings undertakes R&D and investment in renewable energy and portable power technologies. Our vision is to invent technologies that provide consumers with better solutions for their mobile or home power requirements that are more usable, economic and environmental.

xxv 'Ten steps are used in this design approach: (1) Function determination. the mission or purpose of the system, and of the higher level systems of which the project is a part, are identified to select the highest level function. (2) Ideal system development. Several very high level and advanced systems (or products) are developed. (3) Information gathering. The process of selecting an ideal system raises many questions related to the design of a system, its manner of implementation, basic organizational data, and so forth... (4) Alternative systems suggestions. The information gathered will show that some of the components of the ideal system will not be feasible as designed. .. (5) Select the feasible solution. Basic evaluation factors, such as economic, hazard, control, psychological, and organizational factors, are used to select the recommended system or solution. (6) Formulate the system or solution. The exact details of the solution are prescribed in this step... (7) Review the system design. Other persons as well as the designer need to re-examine the system require verification in real life, the test step is used... (8) Test the system. Because a few components of the recommended system require verification in real life, the test step is used. (9) Install the system design. The changes or new items must be ordered, people must be trained, and shakedown or debugging activities must be arranged. (10) Performance measures established. A measurement is made to determine how well the objective of the project has been met, and to establish the operating expectations of the system or solution...' (Nadler 1967, pp. B-647-B-648)

xxvi'Our spontaneous responses to the phenomena of everyday life do not always work. Sometimes our spontaneous knowing-in-action yields unexpected outcomes and we react to the surprise by a kind of thinking what we are doing while we are doing it,a process I call *reflection-in-action.* (Schön 1985, pp. 23)

xxvii‘But according to the metaphor that chaos is order, an increase in entropy has to be understood in a different way, that is, in terms of a kind of change of order. Of key importance I this connection is the idea of a range of variation in random and chaotic motion… Therefore, a measure of the overall range of variation (of the whirlpool) should include both of these factors – the inward and outward growth.’ (Bohm and Peat 2000, pp. 138)

xxviii'The two identified strategies emphasize the opportunity of envisioning design as a multi-functional activity, capable of flexibly adapting to specific contextual factors and contributing to the development of product and business innovation in any given situation. (Bertola and Teixeira 2003, pp. 181)

xxix 'The net result of this theory is to affirm that we can and do know things about the world as it is, for all the contributions of our minds in shaping our perceptions (Whitehead, 1927: passim; 1929:255-79).' (Beardslee 1979, pp. 32)

xxx 'All of these processes demand that disciplines be made ‘commensurable’ – that they can be compared and measured against each other (Strathern 2004). The research policy response is to define research ‘metrics’ – numbers that allow the direct comparison of one piece of research to another. Except that very few researchers, even those in pure disciplines, believe that the value of their research can be encapsulated in a number. The reason why the boundaries of knowledge must be traversed numerically is that, in contemporary consumer society, all public policy must be expressed in dollars or pounds. Academic knowledge must have a number attached to it, in order to write an equation by which society will purchase that knowledge for transfer to students and products.' (Blackwell 2008, pp. 4)

xxxi'There is also considerable professional awareness in the United States of the need for histories of the various design professions. In East and West Germany and Italy, design history is emerging more as a cultural-historical critique of design's role within industrial culture than as a pedagogic tool or as a provider of historical perspectives on the growing maturation of the design professions. These developments coincide with a general rise of interest in design issues in the major industrial nations. Business is now acknowledging design as a significant agent in corporate development, governments increasingly see design as a resource to aid industrial regeneration, and the academic world is reluctantly beginning to consider design and its issues as a significant area of study.' (Dilnot, 1984 pp. 4)

xxxii'...design process is seen as a two-way relationship between a reality to design (in our case the environment) and its model. The first phase of the process consists of the analysis, individuation, and delimiting of design problems. In this phase, one moves through a process of abstraction and formalization, form reality to a model which represents reality in way coherent with the design objectives, methods and techniques. The second phase consists of planning and implementation of design interventions. By working through simulations on the model and throughout directed actions built on specific, defined factors, this phase leads to a controlled modification of reality and to a solution to the problem.' (Chiapponi 1998, pp. 78)

xxxiii'I characterize design as a conversation, usually held via a medium such as a paper and pencil, with an other (either an “actual” other or oneself acting as an other) as the conversation partner.' (Glanville 1999, pp. 88)

xxxiv'Design is not a science, and it is not art – or any other discipline. It has its own purposes, values, measures and procedure.' (Owen 1998, pp. 10)

xxxv'In the last twenty years or so, the concept of design has broadened. We have begun to see cultural evolution as an informal, collective, generational process of design, as in Chris Alexander's story of the Slovakian peasant shawls. Herbert Simon and others have suggested that all occupations engaged in converting actual to preferred situation are concerned with design. Increasingly there has been a tendency to think of policies, institutions, and behavior itself, as objects of design.' (Schön 1991, pp. 77)

xxxvi'In the 1980s we saw the establishment of design as a coherent discipline of study in its own right, based on the view that design has its own things to know and its own ways of knowing them. This had been heralded in the very first issue of Design Studies, when we launched a series of articles on ‘Design as a Discipline’. Bruce Archer again encapsulated the view in stating his new belief that ‘there exists a designerly way of thinking and communicating that is both different from scientific and scholarly ways of thinking and communicating, and as powerful as scientific and scholarly methods of enquiry when applied to its own kinds of problems’ (Archer, 1979). A little later, expanding the idea, Cross (1982) suggested that ‘We need a research programme . At its core is a ‘touch-stone theory’ or idea e in our case the view that “there are designerly ways of knowing”.’ (For further development of such a programme see Cross, 2006.) Most significant of all, Donald Schön (1983) promoted the new view within his book The Reflective Practitioner, in which he sought to establish ‘an epistemology of practice implicit in the artistic, intuitive processes which [design and other] practitioners bring to situations of uncertainty, instability, uniqueness and value conflict.’ Design as a discipline means design studied on its own terms, within its own rigorous culture, based on a reflective practice of designing.' (Cross 2007, pp. 3)

xxxvii'There may indeed be a critical distinction to be made: method may be vital to the practice of science (where it validates the results), but not to the practice of design (where results do not have to be repeatable, and, in most cases, must not be repeated, or copied). (Cross 2001, pp. 51)

xxxviii 'After half a century of cognitive revolution we remain far from agreement about what cognition is and what cognition does.' (Lyon, 2006, pp. 11)

xxxix' Formal idea generation methods are broadly classified into two categories - intuitive and logical. Intuitive methods use mechanisms to break what are believed to be mental blocks. Logical methods involve systematic decomposition and analysis of the problem, relying heavily on technical databases and direct use of science and engineering principles and/or catalogues of solution procedures.' (Shah, et al. 2003, pp. 112)

xl Work motifs (Blau and McKinley, 1979), DETMAX (Steinberg and Hunter, 1984), Xpertum (2009), Collective ideation (Legro 2000), Generative tools (Sanders and Stappers 2003), Organizational innovation (1999), Creative connections (2005), Design experience (1997), Inventive ideation (Ross 2006)

xli A substantial and varied range of research methods has been developed and adopted for the analysis of design activity. The range extends from philosophical reflection to empirical investigation, and includes study of both the natural and artificial intelligence of design. This variety was well reviewed in the first Delft Workshop on 'Research in Design Thinking', in 1991[1] (Cross 1996).

xlii 'Despite these developments, face-to-face interaction remains one of the most important elements in developing ideas (Salter and Gann, 2002). Bly and Minneman (1990), together with other studies (Vera et al., 1998; Gabriel, 2000) suggested that with the introduction of technology, designers will adapt their activities accordingly.' (Kan and Gero 2008, pp. 315)

xliii ' Understanding artistic behaviour The first relationship that one can specify is this: cybernetics, in its quest to understand complex human behaviour may be able to throw light in due course on that highly complex type of behaviour called 'artistic'-a type of behaviour clearly involving control and communication. (Apter 1969, pp. 262)

xliv 'We present, here, sketches from our current work. The work, itself, has been evolving over a number of years. Its workplace has been a graduate seminar which we called "The Role of Metaphor in Learning and Design." Already in the early years of the seminar it became

clear that our interest was not in metaphors (in the plural) as artefacts of language but rather in metaphor as an instance of a generative process. We were interested in what we called "generative metaphor" and the process of making a metaphor, as this expressed a moment (or more often, the momentary articulation of an on-going process) in which a person "comes to see in a new way."' The concern for generative metaphor has gradually evolved into a more focussed attention to the making process itself, and indeed, to the making of things, as this, too, involves coming to see in new ways. Thus, the emphasis has shifted from the "metaphor", in our course title, to "learning and design" as these latter interact in the course of making and shaping.' (Bamberger and Schön 1983, pp. 68)

xlv 'There is evidence that learners are 'jumping through hoops' and being advised to take a template or formulaic approach to designing (Atkinson, 2000; McCormick, 2004; Davies and Elmer, 2001). Hayward et al. (2000) and others caution against creating assessments that dominate and encourage strategic learning.' (McLaren and Stables 2007, pp. 2)

xlvi 'The aim of education (as an end result of which an individual should be "educated") is not to accumulate knowledge, but rather to shape consciousness, to encourage a child's ability to think independently, to work in a creative manner. If we want our ideas about education to prevail, then society should begin to concern itself with people who are creative. The creative potential of the nation should be "preserved by the government." Presently the value of knowledge lies in its practicality, in its actual results, in the "utility" that results from creativity. In fact the value of a creative personality really lies in the personality itself.' (Mykheeva, et. al, 1991 pp. 49)

xlvii The imagist conception is popularly linked to descriptions of designing. It is generally taken as 'seeing with the mind's eye'. Thus, a designer may develop a design through an iterative procedure; the imagistic materials from the mind's eye form the basis for sketches, drawings, models etc. which can then feed back to furnish more images which can then in turn be used to further develop the design work. However, this description is misleading in that it invites a comparison between imagery and design which both mislocates the significance of these phenomena and also fails to give an insightful account of them. When we disentangle these misconceptions, we can construct a model of design activity which puts the notions of imagery, observation, perception, sketching, drawing and modelling into a more illuminating perspective.' (Liddament,2000, pp 589)

xlviii ' The research usually focuses on rates of innovation and not on single innovations except in the instance of diffusion studies (e.g. Collins et al 1987, Ettlie et al 1984, Walton 1987) where the speed of adoption is an issue. The importance of studies of innovation rates rather than a case study of a single innovation must be stressed. In the meta analysis of Damanpour (1991), he found that the greater the number of innovations considered in the research study, the more consistent the findings. This is an important conclusion, namely, that the focus on rates of a phenomenon will produce more consistent results than the analysis of a single event.' (Hage, 1999 pp. 599-600) The idea is to develop a method that is not incremental 'Although the definition has remained consistent, the particular kinds of innovation examined have shifted across time as well as have the kinds of problems that have interested people. In the 1960s and 1970s the emphasis was on incremental change in public sector organizations (Allen & Cohen 1969, Daft & Becker 1978, Hage & Aiken 1967, Kaluzny et al 1972, Moch 1976), while in the 1980s and 1990s it has been on radical change in private sector organizations (Collins et al 1987, Cohn & Turyn 1980, Ettlie et al 1984, Gerwin 1988, Jaikumar 1986, Teece 1987, Walton 1987). Examples of the latter include flexible manufacturing(Collins et al 1987, Gerwin 1988, Teece 1987), retortable pouches (Ettlie et al 1984), robotics, automated handling of materials, or computer numerically controlled machines (Jaikumar 1986), and even ship automation (Walton 1987) and shoe production (Cohn & Turyn 1980). Furthermore, the measures for "radical" altered from subjective ones (Kaluzny et al 1972) to more objective ones (Cohn & Turyn 1980, Collins et al 1987, Ettlie et al 1984, Walton 1987). As this shift in focus occurred, the nature of the problem being investigated also changed. Rather than simply count the number of adoptions within a particular time period, the analytical focus became differential implementation of radical innovations, most typically advanced manufacturing technologies (see Zammuto & O'Connor 1992).' (Hage 1999, pp. 600)

xlix Information, in seeming stark contrast to complexity, is process independent. Here is what we mean: Information is complexity relative to the class of all conceivable processes. For instance, suppose we wish to measure the complexity of an object x with respect to several different classes P1, . . . , Pn of processes. Then the complexity of x varies with the notion of process: It will have complexities c1(x), . . . , cn(x), where ci is calculated with respect to the class Pi . However, because information is complexity relative to the class of all conceivable processes, the information in an object like x will not vary. That is what we mean when we say information is process independent: It is an element present in all notions of complexity. (Martin 2006, pp.293)

l 'High-dimensional datasets present many mathematical challenges as well as some opportunities, and are bound to give rise to new theoretical developments [11]. One of the problems with high-dimensional datasets is that, in many cases, not all the measured variables are \important" for understanding the underlying phenomena of interest. While certain computationally expensive novel methods [4] can construct predictive models with high accuracy from high-dimensional data, it is still of interest in many applications to reduce the dimension of the original data prior to any modelling of the data.' (Fodor 2002, pp. 1)

li 'We study complexity and information and introduce the idea that while complexity is relative to a given class of processes, information is process independent: Information is complexity relative to the class of all conceivable processes. In essence, the idea is that information is an extension of the concept 'algorithmic complexity' from a class of desirable and concrete processes, such as those represented by binary decision trees, to a class more general that can only in pragmatic terms be regarded as existing in the conception. It is then precisely the fact that information is defined relative to such a large class of processes that it becomes an effective tool for analyzing phenomena in a wide range of disciplines.' (Martin 2006, pp. 292)