An action research approach to early concept iteration in a design consultancy

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Abstract: This paper investigates early stage concept iteration within a design consultancy environment. The aim of this research was to outline and explore the importance of early phase concept iteration within the consultancy environment whilst highlighting the main influencing factors that lead to the iterative development stages of the design process. A literature review helped develop a theoretical framework for research into the concept of design iterations within the consultancy environment. An action research approach to concept iteration in product form design and development at the early stage of the design process was employed. It was found that budgetary constraints, time management and client expectations were determining factors in driving early concept iteration. Moreover, such findings may be of benefit and use to design researchers, consultants and design managers.

Keywords: design management; design consultancy; concept design iteration.


Biographical notes: Tom Page’s background is in avionics worked as a development engineer for Ferranti Defence Systems Ltd. in Edinburgh. In 1990, he took up a two-year fixed-term research assistantship at the Engineering Design Research Centre in Glasgow. Upon completion of this role, he taught Computer-Aided Engineering at the University of Hertfordshire in Hatfield. Since moving to Loughborough University in 2003, he has taught electronic product design, interaction design, design and manufacturing technology and physical computing. His research interests are in engineering design, design education, technology education and electronic design automation.

1 Introduction

The purpose of this research was to explore the way in which designers build upon early phase concept iteration through the use of design tools, whilst documenting the impact of contributing factors in a design consultancy. Primary research into design consultancy structure formed the basis of the research whilst informing the way in which design
practice was affected by the chosen working environment. In addition, this research
detailed the way in which design attributes direct the development of the design process
and how each project phase is managed and conducted.

1.1 Aim
To outline and explore the importance of early phase concept iteration within the
consultancy environment, whilst highlighting the main influencing factors that lead to the
iterative development stages of the design process.

1.2 Objectives
The main objectives of the study were to:
- Identify the main structures of concept iteration, highlighting implementation
techniques;
- Identify the importance of early phase concept iteration from both the client and
consultancy’s points of view;
- Discover the main influencing factors during early phase design iteration;
- Highlight how the client/consultant relationship can influence the overall creative
process;
- Demonstrate effective concept generation techniques and the positive design benefits
of early stage form exploration.

2 Literature review
The review focussed on the area of design consultancy and surrounding factors that
influence early phase iteration. Main factors include: The application of concept
generation and iteration within a consultancy, the underlying structure of their
application and overall influencing factors that contribute to the iterative design process.

2.1 Consultancy environment
When identifying the importance of early phase design iteration within the consultancy
environment it was important to understand the context in which it is applied.
Consultancies are often regarded as influential concept providers (Abrahamson, 1996;
Suddaby and Greenwood, 2001). The need for the introduction of innovative concept
iterations can aid the stimulation of service demand (Benders and Verlaar, 2003).
Companies typically compete in the marketplace on the basis of quality, price, and
service delivery. The most successful companies compete on only one of these criteria:
few companies can sustain competing in two areas and remain economically viable,
(Bergeron, 2002). Although consultancies may aim to increase or sustain profitable
business through the application of concept iteration techniques, Bergeron (2002)
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identified the typical reasoning behind the approach of a client. This suggests that any adopted ‘project framework’, specifically design iteration, may require a degree of flexibility and adaptation based upon client expectation (McCullagh, 2003).

Within the consultancy environment, the point at which a design enters the first phase of conceptualisation and refinement is mainly governed through the informed view of a Project Champion (Vogel, 1997), which in the case of a consultancy is often a Technical Director or Senior Designer. As such, they have the challenge of assessing the point in which concept development should be moved forward to review, refine or present to the client (Vogel, 1997; Becht and Gommer, 1996; Heller, 1999).

Heller (1999) discusses the role of Project Champions and their inherent ability to steer a project in a productive direction. It is often their role to appreciate what the client perceives, without becoming too attached to a project and determine, at what point the project moves forwards from the concept stages of the program into a development phase. Often time can be wasted if a clear direction is not agreed upon or chosen by the Project Champion, which can also reduce early phase concept generation time (Heller 1999). Furthermore, noted by Vogel (1997), Becht and Gommer (1996), is the importance of the effective project delegation. To maximise the potential ‘design time’ available, the Project Champion may divide design activities between a team of best suited designers. Design time can be attributed to individual project phases and reflect the consultancy outcome.

The effects of an extended design phase are discussed by Becht and Gommer (1996). The main issues highlighted surrounding the design process suggest that, discussion with the client about the possibility of project change based on initial proposals, may be difficult for the client to comprehend.

2.2 Client/consultant relations

Kokenge and Grubow (2003) revealed that it is apparent that consultancies require a combination of techniques to effectively interpret data provided by a client. However, when it comes to design, respecting the consumer as boss is very different from asking consumers “what they think” about design. Consumers often look backward, referring to the past design aesthetics as they attempt to explain what they would like to see in the future.

Kokenge and Grubow (2003) suggest that although the client will have an idea of where the project should go or how it may look, reference is often based on previous products. It is the role of the Project Champion to interpret client expectation and manage design teams to develop concepts that exceed client expectation (Heller, 1999). The influence of expectation, through presentation of concept iterations, may lead to client disappointment (Becht and Gommer, 1996). False sense of expectancy created through the portrayal of a concept, can direct the client to believe design iteration is further developed than true. McCullagh (2003) suggested that designers learned that it was not necessarily wise to use the new digital tools for showing early concepts, because they could appear “too finished” to the client. This issue became particularly problematic if the client liked a particular concept based on a “photorealistic” visual and requested a rapid move to production (McCullagh, 2003).
Expectation within a client can be influenced during the early concept generation stages of the design process as discussed by McCullagh (2003). It may also be said that the chosen presentation style should not exceed that of the consultancy, as it will only create high expectation within the client, leading to possible disappointment with the final outcome. If the consultancy is unable to keep up the high quality of presentation at every stage of the design process, an element of risk may be established in the client’s mind (Becht and Gommer, 1996). The iterative cycle of concept generation and its outcomes with respect to client satisfaction can be referenced to the work of Heller (1999).

Heller (1999) suggests that there is not only disappointment when a consultancy does not meet the expectation or needs of the client. The enhancement of disappointment from a client’s perspective may be increased if concern about design direction is not expressed by the client themselves during early concept iteration stages. Consistency at point of contact is an important role within the relationship built between the client/consultant. Vogel (1997) explores the importance of the relationship, not only between the client and the Project Champion, but also the contact team that first meets the client. Contact by team members on an intermittent basis can instil confidence within a client (Becht and Gommer, 1996). After all, they are the ones who built your confidence enough to sign a large contract (Vogel, 1997). The importance of the establishment of client confidence can be iterated within the concept generation and iteration phases of the project.

2.3 Design iteration

The affective application of concept iteration within early stages of the design process can be dependent on designer attributes as discussed by Page (2013). He explored the increasing variety of tools the industrial designer has at their disposal to support the development and communication of design intentions. Findings indicate that sketching continues to underpin design activity. The use of such design tools may help the designer steer away from the fixation of one design, and encourage them to explore the benefits of confidence within wide variety of iterative work. Less experienced designers tend to lack confidence in their sketch ability and they find the dynamic, unconstrained medium at odds with an approach to design activity that errs towards fixation and attachment to concept (Page, 2013).

The benefits of an adaptable designer are valuable to a consultancy, the fixation on one design can lead to limited visual development in the early phases of a design (Page, 2013). The ability to quickly adapt and find similar enthusiasm for a different concept is an attribute that should be found in a well-practiced designer. Often time can be wasted if clear direction is not agreed upon or chosen by the Project Champion for presentation to the client, which can also reduce early phase concept generation time (Heller, 1999).

The importance of the ability of self-removal from a project can be reiterated in the notion of becoming fixated on a single design or direction (Page, 2013). The ability of a designer to generate large amounts of concepts (aesthetical or engineering solutions) with equal emotional attachment (Vogel, 1997) can allow the client or Project Champion to freely choose their preferred design or direction without the disappointment of the designer. Due to the demands of a client/consultant relationship (Heller, 1999), a style or form may be chosen early in the project. This may benefit the project from a time/cost point of view, but can also compromise overall product aesthetical value.
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3 Concept iteration

3.1 Iteration

Concept iteration and development, through graphical sketch work is used during initial phase concept generation to inform and direct further product development within the consultancy. It is commonly noted that the way in which designers go about the generation of such concepts is currently increasing. My own research has explored the increasing variety of tools the industrial designer has at their disposal to support the development and communication of design intentions. Findings indicate that sketching continues to underpin design activity (Page, 2013). He suggests in perusing an active approach to industrial design, the importance of early stage sketch development with the notion of communication, is one of the most valued design tools.

The generation of large numbers of quick sketches allow a designer to explore conventional themes without overshadowing constraints that can hinder a creative process (Steur, 2007). Production of iterative concepts also encourages designers away from the fixation of a single design and offers the diverse benefits from a wide verity of roughly explored sketch work (Heller, 1999). Sketch exploration conducted by Scott Robertson (2012) demonstrate a fast-paced work ethic, in which the designer aims to explore abstract form development with the aim of informing future form development (Figure 1).

Figure 1 Concept sketch work ‘Buggy Sketches’ (Robertson, 2012)

The work depicts the way in which Robertson (2012) explored unrestricted form and highlights the way in which clear iteration is shared between designs. The importance of initial phase concept iteration is demonstrated through the exploratory work of Robertson (2012) and can be seen to progress from the initial iterative visuals through to a fully developed sketch. Those with experience of practice possess a stronger awareness of tool use as located within and informed by the requirements of the design process.

Robertson (2012) exploited his awareness of design tools and experience to produce several concept variations in a limited amount of time, with disregard for potential restrictions and costing. It could be noted that initial concept generation should aim to be
developed without the notion of design constraints to allow for a wider variety of concepts to be generated. Although, more experienced designers may choose to consider such restrictions throughout concept generation stages to ensure a design can be easily moved forwards into development phases. Robertson highlights his design experience within the early stage concept sketches, as he is freely exploring more than one concept without the need to become fixated on one idea to early in the project (Heller, 1999). Clarity of design direction, driven by concept exploration, can be seen in the latter stages of Robertson’s concept work (Figure 2).

Figure 2  Development work ‘Buggy Sketch’ (Robertson, 2012)

Compared with Robertson’s (2012) efforts, lack of initial concept generation during early development phases can encourage projects to move forwards with poor aesthetical developments. This can often occur if a designer becomes fixated on a concept too early in the design process, with lack of explorative consideration given to other concepts. It is also noted; that due to high demands during the client/consultant relationship an aesthetical direction may be agreed on very early in a products development (Heller, 1999). The impact of such a decision can provide benefit from a time and cost aspect, but can often prove to be detrimental to an overall product aesthetic. In contrast, design students tend to take a more constrained and fixated approach to their design activity (Page, 2013).

Although the requirement of iterative concept generation is to provide an outcome of a visually well-developed product, it is also imperative that designers recognise the point in which a concept should be developed. Whilst conducting action research, it was made clear that a designer’s ability to understand when an iterative cycle of sketch development meets the requirement of a client can be a valuable asset to a consultancy. Action research conducted within a consultancy informed the understanding of what process design refinement goes through before it reaches a client. The stage at which a concept enters a stage of refinement usually began with exposure during review meetings. During such meetings, it was the task of the ‘Project Champion’ (Becht and Gommer, 1996; Vogel, 1997), to structure the development process and determine what concepts should be pushed forwards for refinement based on client expectation.
4 Case study

This study explored a development project tasked to Design Reality Ltd. by a client, for the re-styling of an existing product (Figure 3). With the aim of exploring good and bad examples of concept iteration, the study presented the impact of concept generation on current and proposed products. The decision to use the following example was taken as no first-hand work was conducted on the project whilst practicing as a resident designer at Design Reality Ltd., helping to inform an impartial view on the subject material (Root-Bernstein, 1989).

4.1 Existing geometry

As can be expected with such a utilitarian device, the existing geometry is mainly driven by internal assemblies. This can be identified through the use of simple forms combined to generate the overall body of the product. A likely explanation for the overall form of the product is the lack of initial concept development during the early phases of the project. Instead, the design iteration has taken an ‘engineering’ type development where internal components have been captured in a 3D environment, with the outer casing being modelled in situ. The impact of such development techniques can see the aesthetics of a product overlooked, but can benefit product turnaround times.

Figure 3  Air cylinder gauge

The existing product can be divided into simple forms that echo the aesthetic form of the internal componentry (Figure 4). The impact of such forms, from an aesthetic point of view, suggests that this product would have benefited from early phase concept iteration which could have been used to drive product form as opposed to the internals.
Figure 4  Form exploration

Figure 5 demonstrates a design which has been developed and informed from a comprehensive set of explorative sketches. The re-styled Air cylinder gauge highlights the impacts of well explored design direction that leads to an aesthetically fulfilling design whilst offering the same functionality as an existing product.

Figure 5  Air cylinder development sketch work
4.2 Design guidelines

Whilst conducting action research, it was highlighted that the use of design guidelines was common practice within the consultancy. The use of such guidelines was of particular interest with regards to this case study as a previous project had been to develop a set of ‘product guidelines’ for the client. The main aims of the guidelines are to inform designers of the do’s and don’ts when considering the design of future products to ensure they fit within the proposed range. This is done by ensuring product associativity (Wilson, 2011) through similarities such as styling features, logo placement, split-line etc. that consistently feature across several products. When designing new safety products we would like you to consider our selected shapes and incorporate them into your designs where possible (Design Reality Ltd., 2011)

Figure 6  (a) Historic form pallet, (b) future icons pallet

Within the guidelines developed by Design Reality Ltd., a section has been dedicated to the importance of brand associativity through visual aesthetics. Through the breaking down of visual identities from existing products (Figure 6a), designers were able to establish what forms make up the consistent product range. This was then used to develop a secondary set of forms that should be used to inform future product designs (Figure 6b). Figure 7 demonstrates the use of historic and future forms taken from the guideline pallet to help inform the initial concept development of the re-styled air cylinder gauge.

The main advantages that design guidelines and, in particular, form pallets offer, is the overall recognition of shape and form that are comprised to ensure consistent design identity (Wilson, 2011). It could also be said that the application of pre-defined forms can offer the benefit of time reduction through the lesser requirement for rigours concept exploration.
5 Development tools

Developing form in isolation from other constraints such as product sizing, proposed manufacturing techniques and material choices can have detrimental impacts during further product progression (Steur, 2007). The following segments aim to highlight the importance of other development tools that can impact initial concept iterations during early phase development.

5.1 Design sizing

Sizing constraints may be used to drive initial concept iteration through the use of product envelopes, internal component sizing, PCB layouts and ergonomic evaluations. The benefit of such criteria can see a product conceptually developed whilst still remaining feasibly attached to the required outcome. Whilst practicing as a resident designer, it was noted, the initial sizing approach chosen by individual designers changed dependant on required outcome. Popular choices included 2D scale underlays onto which surfaces could be directly plotted and 3D ‘bread boarding’ of internal componentry. The benefit of working in such a way proved to allow the designer to identify sizing limitations and assess the impact (if any) on external surface geometry.

5.2 3D environment

Much criticism has been levelled at the inability of CAD to support the kinds of explorative design activity required for conceptualisation. Page (2013) suggests that 3D
environments, from a conceptual point of view, can have restricted limitations when aiming to explore initial concept developments. The main reasoning for this is the restrictions imposed by the CAD users themselves as opposed to the competency of the package. A designer may understand what they are trying to achieve, but lack of ability in a CAD package may lead them to settle on something less appealing. It could be said that for a concept to be freely explored, with desired results, the phase in which the design is moved into the 3D environment should be carefully considered. Of course they understood the value of CAD, but spoke of a concern for the ways it may limit student creativity, ‘a student’s design being too influenced by the constraints of this or that software’ (Page, 2013).

It is noted by Page (2013), that design students in particular, struggle to distance themselves from the impacts of the constraints of working in the 3D environment. This could be said to be true with lesser experienced designers who lack the skill set and discipline to move and interoperate their concept interactions in the 3D environment. Figure 8 demonstrates the importance of ‘design intent’ within the 3D CAD environment. A fully explored and iterated concept sketch is used as the bases to drive and inform the computer generated 3D surfacing.

![Figure 8](image_url)

Working in this way allows a designer to capture the desired intent of a concept and ensure the CAD model is driven by the initial design work as opposed to changing due to lack of CAD competency. The use of cross-sectional, rail and construction geometry (Steur, 2007) can also be used to inform the 3D construction of such designs, further upholding intended design direction. The most commonly used plane is the cross-section. Cross-sections are used in ‘building up’ an object and also determining shape transitions (Steur, 2007).
During the initial exploration stages, sketch work can be used to highlight and suggest surface variation through the clear depiction of cross-sections and construction geometry (Steur, 2007). The placement of rails and cross-sectional views on a concept sketch can help depict the designer’s intentions to the proposed audience. Figure 9 demonstrates how a sectional view can help the understanding of a product’s overall form, which can be especially helpful when moving into the 3D environment (Page, 2013).

**Figure 9** Construction geometry

The importance of free flowing initial concept development can be seen when used to inform the CAD development stages of a design, although, as design is an iterative process, many experienced designers may hold the ability to work conceptually alongside any initial CAD development which can be very beneficial within the consultancy environment.

6 **Action research**

The discoveries made are that of observations undertaken whilst conducting action research throughout the summer vacation within Design Reality Ltd. Although the observations cannot be bolstered by the transcription of interviews of proposed interviewees, all efforts have been given to produce a removed observation of the working scenario to inform this research (Root-Bernstein, 1989). The approach of action research was undertaken within the consultant environment with the notion of identifying each individual role, design attribute and client consultation. This ensured a good understanding of the way in which design iteration took place within the early stages of the proposal and what affected the way in which concept development evolved.
6.1 Action research methods

As discussed by Root-Bernstein (1989) action research provides a valuable grounding within the field in which research is taking place and comprises research studies carried out in the course of an activity or occupation, typically in the field of education, to improve the methods and approach of those involved. It is the aim to conduct action research whilst practicing as a resident designer at Design Reality Ltd. The application of action research will provide first hand insight into the effects of the client/consultant relationship on early phase design iteration. Action Research focuses on addressing a situation where problems exist. Sometimes the action researcher may “discover” the problems, but in other situations the problems “discover” the action researcher (Root-Bernstein, 1989). In contrast to the definition of Root-Bernstein (1989), the authors intention is not to ‘address’ a problem through research and insight. The aim of the proposed research is to inform of the benefits of concept iteration through the exploration of the subject. The principal threat to validity for action research is the lack of impartiality on the part of the researcher (Coughlan and Coughlan, 2002).

In response to Coughlan and Coughlan (2002) the approach of the conduction of action research within the consultant environment was undertaken from the role as a resident designer. Although the researcher (the author) was part of the design team, the position should remain removed to approach the research with objective opinion. The view discussed by Patnaik and Becker (1999), of the importance of the sympathetic approach by an interviewer towards the design consultancy environment, suggests that implicit goals of any interview conducted should be well conceived. Through the pre determining of questions, the allocation of time needed to conduct an interview within the consultancy environment will be clear. Conduct interviews in context, while the issues are still fresh in persons mind.

The coupling of action research and interviews within the context of the environment provided benefits for the researcher as discussed by discussed by Patnaik and Becker (1999). It is suggested that the appreciation of answers from the interviewee can be further enhanced when conducted in context. To make decisions based on the research, the findings must be presented in a vivid and actionable form. The needs are better understood when supplemented with drawings, photos, audio recordings, and/or video (Patnaik and Becker, 1999). They suggest there is importance within the display of findings to ensure the understanding of the data collected is well received.

6.2 Influencing factors

Concept iteration within the consultancy environment is a subjective process dependent on design criteria established within a proposal agreed by client and consultant. The proposed outcome of the agreed proposal often dictates the way in which design work is conducted. For example, a proposed body of work with the approved deliverable of five varying sketch concepts would benefit from the generation of a number of quick exploratory sketches during the early phases of the project. These can then be used to refine and inform further sketch development at next level iterations. During the action research phase of the project, it was highlighted that although a proposal outcome may require ‘five varying sketch concepts’, the way in which certain designers get to the outcome is likely to vary based upon the following: design time; use of allocated time; and designer experience & ability.
6.3 Design time

The way in which time is allocated to each phase of a proposal generally dictates the depth of the work produced for each project. It was highlighted that time would be allocated on a requirement level based on a Project Champion’s knowledge of design project and proposals. Project proposals were handled by senior members of staff with high levels of design experience to ensure that the understanding of what would be required during the each project phase was best estimated. Design time may work in favour or against the task in hand dependant on project and proposal. For the success of a project it is important that full consideration and evaluation is given to the proposed task.

Pro-efficient allocation of project dependant design time attribute to the successful completion of projects on time, and on budget. Correct time allocation allows the designer to spend the time deemed appropriate, by the Project Champion (Vogel, 1997) on each phase of the project, which helps the meeting of deadlines. Although appropriate time management can contribute to the success of a project, the requirement of flexible time management within a consultancy can often benefit a project. For example, if a certain project phase runs over due to designer error or lack of time allocation by the Project Champion, it can be good practice to ‘crib’ time from other coming phase to ensure the project comes in on proposed time. Restructuring time plans within a project can be done to the benefit of the consultancy if appropriate management of the latter phases is successful. Although this can be the case, observations made suggested that time was mainly managed from a front end perspective, where by time was gained within the concept generation and development phases of the design process. This method was employed to ensure technical stages of the design process, such a CAD development and prototyping had the most time allocation to ensure proposed designs functioned with the aim of not running over budget.

Whilst working within the consultancy environment, it was highlighted that early phase concept development can suffer with the allocation of design time which later can have a detrimental effect on product aesthetics. Designer dependant, time limitations can cause a product to be moved into the next phase of a project without the full range of concept exploration that may be required. Knock on effects of poor aesthetical/functional consideration can range from the premature move to the product development phase of a project, in turn, causing a breach in client expectation (McCullagh, 2003) when delivering the final outcome. The ability of working towards an aesthetically pleasing product that meets client expectation can be advantageous in easing the client/consultant relationship, but also can aid in the securing of future projects through the development of a high quality consultancy portfolio.

6.4 Use of allocated design time

Another issue highlighted upon conducting action research was the inefficient use of allocated design time due to lack of design experience in the required design task. The impact of having a lesser experienced designer working on an unfamiliar design task was mainly observed from the aspect of causing the project to require more time to produce the required deliverable or requiring the shortening of following phases. Major impacts of this type of working could be seen towards the end of a project where it came apparent that the work produced was not what the client had expected or a project had run over budget.
6.5 Designer experience & ability

Another attribute that can cause an impact on the way in which early phase concept generation is managed is the experience and ability of the designer that is undertaking the design work. During the action research phase of the project, it was noted that the Project Champion would approach a certain member of the design team, dependant on the task in hand, in order to make full advantage of the design time available (Vogel, 1997; Becht and Gommer, 1996; Heller, 1999). The main advantage of this approach was highlighted during project consultation meetings where by designers working on the live project would present the outcome produced within the allocated time. For example, a designer who holds the ability to produce fast, iterative sketch work would be well suited to the requirement of a well explored, but refined concept sketch deliverable. It can be said that this observation was similar throughout all design phases, with good management seeing that ‘best suited’ designers were allocated to each role (CAD, sketching, development etc.). Although this was the case for most live projects within the consultancy, there were occasions in which the requirement for a lesser suited designer was required to work on an unfamiliar phase of the project. It was noted that this was mainly caused by the fast paced, high demand environment which occasionally saw designers required to work on anywhere between two to four projects at any one time.

7 Discussion

7.1 Action research within context

Through the application of action research, the awareness of the explored ‘design tools’ available to a practicing designer has influenced the opinion that it is not always best practice to employ all tools on every project. It could be said that often the best approach use an appropriate combination of such tools based on influencing factors (designer ability, cost, time and client expectation). This opinion has also been strengthened through the exposure to the working environment of the design consultancy in context of this research.

It was noted that, in the consultancy environment, the benefits of designer ability posed a higher priority to the overall structure of the working environment. Due to the smaller number of employees, it is in the consultancy’s best interests to assemble a team of designers with the broadest skill-set and as designers often work alone or in small groups, it is good practice as a consultant designer to be fluent in all subjects of design. This approach can often see a designer produce the best outcome for the project proposal as opposed to an effort that does not meet the client’s expectation (McCullagh, 2003). In conclusion, the action research approach used to gain first hand insights into the working consultancy environment has proved beneficial in discovering the varied application of iterative design tools dependant on designer ability, project proposal and client expectation.

7.2 Design process

The iterative nature of the design process means there is little overall structure to the initial development of a concept to ideation. It could be said that there is merely a ‘best
suited’ approach to the proposed design and it is the task of the chosen designer or team to realise the use of best suited design tools to reach a conclusion. Such techniques can be seen in Figure 8, where the culmination of several exploratory sketches and CAD overlays has been used to develop an aesthetically pleasing result that meets client expectation. As all design tasks are governed by project proposals (a contract agreed by both client and consultant) it is down to the experience and ability of the designer to realise the appropriate time frame and tool to see the design reach its proposed requirement within a design consultancy. The use of ill-fitting design tools are often seen as a waste of project resource and allocated time.

7.3 Relationship constraints

The relationship formed between the consultant and the client could be said to be a separate avenue in relation to the iterative concept process governed by designer ability. Although this may be the case, the impact of the relationship can affect the overall outcome proposal that drives a project. **Budget** – The defined budget set during the project proposal stage of the design process is used to dictate and inform the allocation of design time. It is considered bad practice when consultancies run over budgets due to poor allocation of design funds. **Time** – Dependant on agreed project proposal, certain project phases may be restricted in design time. This has an adverse effect on the length of design time that can be utilised during different stages of the process, often limiting iterations. **Client expectation** – It is great value to a consultancy that possesses both project champions and designers that have the available attributes to interpret and understand client expectation. This ensures the capability of delivering high quality products that are within budget and on time. The combination of such influencing attributes can all affect the overall direction of project development. This being the case, it is often down to the Project Champion (Becht and Gommer, 1996; Vogel, 1997), to understand and interoperate the main requirements of the client.

8 Conclusion

The overall benefits of early stage concept iteration within the consultancy environment can be echoed in Robertson’s (2012) explorative sketch work. This demonstrates a visually well explored product produced within the working time constraints of the consultancy environment and has also been highlighted in the chosen case study (Figure 8). Robertson (2012) also demonstrates the importance of a designer’s ability and awareness to produce a large number of high quality works within a pressing time frame which can be very beneficial within the consultancy environment. The main benefits, highlighted through action research, of initial concept generation within the consultancy environment is the development of an aesthetically pleasing product that exceeds client expectation. It is also advantageous if a developed concept has seen sufficient form exploration to inform the overall aesthetical intent and direction which can be used to focus latter design phases towards the designers intended goal (Figure 8).

It has been highlighted that individual designers require confidence and understanding in their own attributes to be able to produce a well-rounded, aesthetically pleasing and sympathetic product that meets the clients required needs within the tight constraints of
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the consultancy environment. As the nature of a design consultancy calls for a fast paced work ethic, the way in which a designer goes about the development process can have detrimental effects on project lead time, client deliveries and budgeting. The realisation of the importance of early phase concept iteration within the working consultancy can be said to be a subjective topic dependant on several underlying factors. Concept iteration is influenced not only by the designer tasked with the project, but also ability, time allocation, Project Champion’s assessments, and client expectations.

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