I just want to design a sexy flying car!
Teaching *design-led innovation* to designers

Cara Wrigley, Sam Bucolo

cara.wrigley@qut.edu.au

GPO Box 2434, School of Design, Queensland University of Technology, Brisbane, Australia

Abstract

Many international management programs have capitalised on the value design can have upon potential business solutions and strategies (Martin, 2009 & Brown, 2008) as well as many international design programs introducing designers to business theory and curriculum (Manzini & Rizzo, 2011). This paper presents the findings from structured interviews with undergraduate design students and design industry professionals. Current literature surrounding design led innovation and the role designers' play is also discussed and the challenges facing designers in this emerging design era are presented. The findings from this study indicate that most designers enter an undergraduate program not wanting to become the business leaders of tomorrow. Instead, they enter in the hope they can humbly help people and to make a difference in the world. There are contentions with this perspective, felt by industry, academia and students around why designers need to be taught business theory content. This paper provides the first step to overcoming this challenge by providing insight into the attitudes, perceptions and challenges designers face in this new design era.

KEYWORDS: business strategy, design education, design-led innovation

Introduction

Traditionally, the role of design within companies has been confined to manufacturing and production – or – as a styling afterthought. Increasingly, design is being viewed as a vital and important strategic business resource (Dell'Era et al., 2010) and consequently companies worldwide look to design to help them innovate, differentiate and compete in the global marketplace. The role of the designer as professional is developing to a point where they are needed and wanted for much more than as specialists in the manufacturing and aesthetics of an artefact (Wrigley & Bucolo, 2011).

Whether this development of the design profession could have been predicted, is an argument of historical trends to consider. For example, William Morris in his time would consider a designer as an artist (Gorman, 2003). However, advancements in technology have

enabled mass-production to take place, and designers have indeed become specialists in manufacturing, ergonomics and aesthetics. We are now coming to a time when it takes more than new technology for a design to be truly innovative. Designers are now being brought into the design process, not as a late stage add-on to make products or ideas attractive to customers, but at the stage where they can create products and services to successfully meet the customer's needs and desires (Brown, 2008).

More and more business are starting to see the value design brings as a different way of thinking, doing and tackling problems from outside the box. In practice, design is key to greater productivity, whether by way of higher-value products and services, better processes, more effective marketing, simpler structures or better use of people's skills. Design is no longer a niche market luxury. It is the most pervasive method for businesses to solve problems, ensuring long-term sustainability and gaining competitive advantage. This is done by properly employing, carefully evaluating, skilfully managing and soundly implementing design throughout all aspects a company's business strategy.

Design led innovation, broadly refers to a set of methods which allow the designer to consider and evaluate their design development from multiple perspectives, typically spanning user needs, business requirements and technology demands. The final design solution is not presented as an artefact in isolation, but an integrated product and service concept. As the design profession moves from servicing a manufacturing economy to a knowledge economy, the role of a designer assisting their clients has also evolved and new approaches to design are being used. Design led innovation is a strategy that aims to radically change the emotional and symbolic characteristics of products through a deeper understanding of broader changes in society, culture and technology. Rather than being driven by user needs or technological developments, design led innovation is pushed by a firm's vision about possible new product meanings and languages that could diffuse in society (Verganti, 2008).

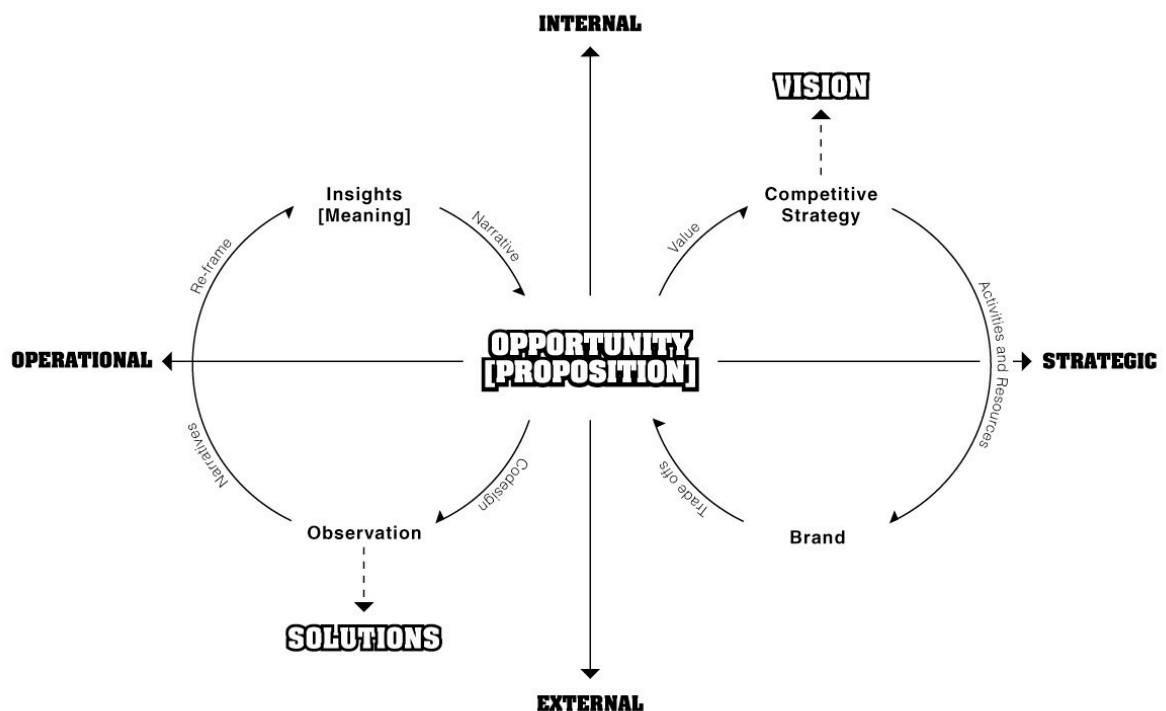## Design Led Innovation Literature

Design led innovation (Bucolo & Matthews, 2011; Wrigley & Bucolo, 2011), or "design driven innovation" (Verganti, 2008), or even "design thinking" (Beckman & Barry, 2008; Brown, 2008), is a strategy that encourages businesses to think about their products (or services) in new ways. Using methods central to the discipline of design, design led innovation pushes change in products, technologies, services and strategies; where the final solution is "not presented as an artefact in isolation, but an integrated product and service concept" (Wrigley & Bucolo, 2011, p. 232). The design led innovation process is defined by Bucolo & Matthews (2011) as having a vision for growth in your business based around deep customer insights, then expanding this vision with your customers and stakeholders in order to map these insights to all aspects of your business.

Unlike the linear problem solving approaches of other disciplines (such as accounting and mathematics), the design process is iterative. Designers employ tacit knowledge and intuition during the exploration and development of potential solutions. Using divergent and convergent and integrative thinking, design teams investigate concepts through brainstorming and rapid prototyping. This process is intended to be quick and cost effective. Central to this is a subjective consideration for the user; as such, storytelling, narratives and experience mapping are used to generate deep customer insights and identify latent needs (Erickson, 1996; Shostack, 1993).

In applying these tools, the design led innovation method collectively considers the perspective of all stakeholders and key components of a firm's business model – the process "reflects both the construction of innovations...and their reception by the public" (Hargadon & Douglas, 2001, p. 499). The design led innovation method aims to alter a firm's vision about the *'meaning'* and use of its offering to create growth and sustainable competitive advantage. Ultimately, it changes the customer value proposition (Bucolo & Matthews, 2011; Verganti, 2008; Wrigley & Bucolo, 2011). While the process is not fail-proof and not every concept will be realised, it is intended to be a process whereby knowledge gained in each iteration is used to inform the next, by challenging and re-framing the idea constantly.

Design led innovation describes a managerial approach to culturally embed design within a business and to enable strategic and radical innovation to occur. It is this difference that affords design led innovation a unique opportunity for radical innovation in business value propositions. This is achieved by using the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity (Brown, 2008).

The design led innovation framework (Figure 1) as developed by Bucolo and Matthews (2011), allows designers to integrate the tools of their profession into the framework, while revisiting and relating the observational solutions to the current company strategy. The framework can also be related to Brown's (2008) discussion outlining that design projects must ultimately pass through the three spaces of inspiration – opportunity, ideation – solutions, and implementation – competitive strategy. "Projects will loop back through these spaces more than once as ideas are refined and new directions taken" (Brown, 2008, p. 35).

Figure 1: The Design Led Innovation Framework (Bucolo & Matthews, 2011, p.8)

Design led innovation places the designer as the catalyst for developing, evaluating and managing the implementation of change within the organisation. The application of a design led innovation approach challenges socially constructed perceptions of the role of a designer within industry. While the role of the designer will evolve, the key activities of a designer remain largely unchanged with the practical development of a design led innovation

approach (Bucolo & Matthews, 2001). The changing role of the designer has also created a new research landscape for how design led innovation is applied within industry-based projects. This study aims to explore these new opportunities by exploring the following objectives and research questions:

» To better understand the attitudes in the industrial design industry and student cohort towards the design led innovation as a new role for design.
» To better understand the perception the industrial design industry and student cohort have towards the theory and process of design led innovation.
» To unpack the challenges facing the industrial design industry and student cohort in regards to the field of design led innovation.

Methodology

This research investigates the perceptions, attitudes and challenges that current design undergraduates and design industry practitioners face in adopting design led innovation principles into their work practices and skill set.

Participants

Twenty participants were recruited to participate in this study. This included students (n=10) and design professionals (n=10). Students were invited to participate based their enrolment in the Industrial Design course at the Queensland University of Technology. Industry design professionals were recruited nationally. The participant's level of industry experience varied, and spanned a variety of roles including; service design, design director, studio manager, product manager and consultant. The sizes of the businesses in which they were employed varied, from 3 to 200 employees.

Procedure and Protocol

Data were collected through structured in-depth interviews, asking questions pertaining to participant's current understating of design led innovation, the designers' role and their attitude towards a shift in the design industry. Each interview took approximately forty minutes and were conducted face-to-face and over the phone.

The questions asked of the industry professionals pertained to their role as a designer, their understanding of design led innovation and their opinion of whether they saw design led innovation as a form of design.

The next stage of the interview involved a case study of an Australian company and it's transformation using a design led approach. This case study was explained and shown visually through an adapted framework outlined in Figure 1 (Bucolo & Matthews, 2011). Questions were then asked to find out if the participant's perceived the design led innovation process in this case study as the role of a designer, or not, and why. Practitioners were also asked if they would want to offer this process as a design capability inside their business, and students were asked if this was a skill set they would want to perform in industry.

The final stage of the interview sought to identify how well the participant's education prepared them for this type of role. Participants were also asked if they believed they were missing skills or capabilities that they feel are needed for this new design role. Additional questions were asked of the student participants pertaining to; why they wanted to study

industrial design, what they saw as their ideal job in design, and what they imagined the future role of design to be in their profession.

Analysis and limitations

The interview transcripts were thematically analysed to identify key categories and themes within the data. The results were filtered into the two different groups of participants (students and industry professionals).

This study is not without limitations. The authors' capacity to generalise the findings more broadly is limited by the sample size of this study. The findings presented in this paper are specific to the interview cohort in this study - 10 students and 10 design practitioners in Brisbane, Australia; and are not intended to represent designers generally. The findings of this research are presented in the following section.

Results

The objectives of this research project were to identify the attitudes, perceptions and challenges of industrial design students, and design industry professionals regarding design led innovation. These results varied between the two participant pools and the following outlines the results of each.

Design Industry Attitudes and Perceptions

The attitude of most practitioners was generally positive regarding their perception of this new field of design led innovation. Designers indicated they would generally embrace this new undefined role. They perceived this new role as a more strategic thinking approach to how they pitch their services to clients. They were inquisitive and curious to know more about it and how to facilitate it in practice. One participant stated "this new form of design can have maximum impact on the return of investment for my clients". Design practitioners perceived that design led innovation allowed the broader field of design to have a greater impact on businesses beyond the creation of products and logos. One participant stated "design led innovation acts as enabler to allow innovation to occur within every aspect of the business. Making design fundamental to a business's success".

Some practitioners, however, were a little hesitant, they were concerned that those who had not been taught how to execute the design led approach, did not know how to produce measurable outcomes from the process, and expressed concern about being involved with it. As one participant states "at this point I would not feel completely confident in facilitating this process, I probably could but I am not an expert and mistakes will be made". One practitioner even went so far as to say he did not want to "make a fool of myself in front of my boss when I propose new methods".

Additionally, many established designers are uncertain about this new role. They indicate that it appears hard to offer as a service to clients, because they do not know what the business model would be. A shift in thinking is needed regarding how designers charge for an intangible outcome, solution or advice. One practitioner claimed "how do you make money from this, it is very difficult to get paid for something where there is not a defined or tangible outcome".

There was a common misunderstanding in practice about the theory of design led innovation and it was often confused with *"design thinking"*. Also, there was a common misunderstanding as to how the set of skills and tools are used by designers differently in the design led innovation process, as opposed to current methods used to generate different thinking styles such as design thinking.

Most practitioners held a basic understanding that design led innovation involved "people focused approaches" (participant) instead of "deep customer insights" (Beckman & Barry, 2008). The participants referred to these in various ways and only some had the extended understanding that it requires the designer to look beyond the end user instead of focusing on all stakeholders involved. Additionally, the cultural transformation that occurs within the company was not mentioned or recognized to be apart of the design led approach until after a definition was provided. At this point, one participant mentioned that, "cultural issues are an important element that I did not raise in my understanding, possibly because it is the hardest thing to do".

Design Industry Challenges

Challenges were outlined by practitioners most of which pertained to the articulation of measurable outcomes to clients and dealing with an outcome that is not tangible. This was expressed as a concern in the process itself and then communicating it to clients, and, more importantly selling it as a service. "From a business leaders perspective, design led innovation can seem somewhat vague and ambiguous with limited tangible and measurable outcomes seen at the outset of the project" as one participant stated. This relates to issues many industry professionals face surrounding how to deal with a clients expectations and what evidence is needed to show that this service has value.

Another challenge for the design professional was the language barriers designers experience when conversing with businesses and their needs. One participant articulated this well by admitting that they "would benefit from more exposure to conventional business thinking to be able to speak the language and understand the viewpoint of those who I would be helping". Design professionals were also unsure of how to produce a convincing delivery to influence clients to engage with this process – which is different to the traditional product projects they are used to working on. The issue of how to create a good client rapport and getting them to trust and put faith in something that was new to the design professional. The challenge of how to 'sell it' to them if you do not know what the outcomes will be. One design professional stated:

> *…how do you deliver it, convincing clients to engage design without knowing the results that they can expect. We know the process works but the results are not known at the start of the project, so essentially we are asking the client to place a lot of faith in the design process…*

One of the biggest challenges for the professional design industry is learning how to re-train their approach, by not jumping to solve immediate solutions like small more tangible design tasks at the beginning. The challenge lies in taking the focus away from the end user as the central variable; this is difficult for designers to do. "I was taught to understand user in terms of ergonomics which has led to a culture of always understanding end users in this way" was one design professional's statement in regards to making this shift in thinking.

Design Students Attitudes and Perceptions

In contrast to the design industry professional only a small portion of the industrial design students expressed a positive attitude towards design led innovation. This is because it was

mainly seen as a means to create more job opportunities for them when they graduate. From the explanations and definitions and case studies given in the interview, design led innovation was characterised by students "as a process that uses design skills, but it just executes them on a different level". They also saw it as a way to differentiate themselves to other graduates and recent graduates competing for the same jobs, "It will differentiate you as a designer and as this new designer you will have more impact and a chance to span every aspect of the business not just product design".

Many students expressed negative perceptions and attitudes towards the design led innovation approach. This was centred on their strong social ideals about the reasons why they decided to study design in the first instance. Most design students undertook their industrial design degree wanting to contribute, even if slightly, to a cause and to solve the worlds humanity problems. Problems such as better drinking water capabilities in Africa, products made from sustainable materials, a new walking frame that assist the elderly in a better way or by helping blind people cross the road, etc. The students interviewed indicated that they are ambitious to sink their teeth into humanities problems and are genuinely interested in helping people through their designs. The need and demand for a design led approach to innovation is to increase Australia's GDP and to obviously increase profits of the company engaged in the process. Students, however, indicated that they had issues with this perspective. In fact, they did not want to be linked to an outcome such as top line growth.

In contrast to this there were also a number of students who embarked on an industrial design degree to design aesthetically pleasing physical products that they can touch, feel and create, like crafts. The drive to be more of an artisan and invent as well as create futuristic luxuriously styled products is evident in first year students. These students have the ambition to become the next Philippe Starck and design the next Apple iPhone. Or, they wish to be famous and their brand becomes their product and takes centre stage over the design. One student indicated that he was adamant that "I just want to design a sexy flying car!"

Design Students Challenges

Like the design professionals, students also struggled with how they would articulate an intangible outcome to themselves and to clients. The student's inability to detach themselves emotionally from their tangible product designs was evident. This was seen when they moved to an intangible solution using the design led approach, students tended to detach emotionally and invest/care less about the outcome. Additionally, their perception of who they are as a designer was seen to be a large challenge. One student stated that talking about money in a design class is just not done and "can be considered as selling out or going over to the dark side".

Students were also challenged by how this approach is executed from within design firms. They are confused as to how they would do this in the workplace, and certainly do not understand how this new business model will work. Their understanding to date on a designer's business model has been based around the traditional approach that the designer exchanges designs, concepts, models, prototypes, manufacturing details for money from a client. The idea of the intangible and how you measure worth, value and trade it for money appears to be too complex. This brings uncertainty and disengagement from students waiting to be involved in the design industry after graduating. One student stated that it "is breaking through our own perception of who we are as designers, what we can offer and our value to business. If we can break through this understanding as more than pure aesthetic and CAD

associations than we can over come such stereotypes as what would I know about business, I'm just a designer."

Another challenge facing design students is the language barriers that are obvious when conversing with businesses. Students were open about the gaps in their knowledge and lack of understanding regarding the drivers of business and how to communicate their messages to the business world. Businesses and designers have different drivers and they appreciate different things. Businesses are constrained by the laws of reality and designers appreciate innovative ideas – not simply thinking as far out of the box as possible. A final year student indicated this in their response to the educational question, stating:

> …the teaching of design in relation to business world needs to be integrated into the curriculum from 1st to 4th year rather than one unit at the end of the degree. This way, students are learning and cultivating their definitions of design as a skill and a role with the business facets exposed. Come 4th year many students have already cultivated their expected role as a designer and lose faith in the business level of design and its importance.

The final challenge, identified through the case study questions in the interview for design students, was how they take the focus away from the end user and the end product solution. Too often they jump-in and start solving the immediate design problems, such as a brand re-design, new website etc. Design students are taught to solve problems, answer briefs and do exactly what the assessment item asks of them – they are not encouraged to challenging it. Nor are they challenging if these are the right problems to be designing for in the first place. This is a crucial re-frame technique in the design led innovation process.

Implications for Education and Industry

The practice of design has seen a rapid transformation over the past decade (Wrigley & Bucolo, 2011). As part of this transformation, the profession of design has also evolved to meet the growing expectation of clients. In recent years, designers typically have formed part of a larger eco-system of professionals, which develop innovative sustainable products and services for a wide spectrum of clients. To meet this changing demand, the knowledge and skills of a contemporary industrial designer have expanded to compliment their existing expertise in manufacturing design, but to also consider the experiential, business and supporting services of a final design solution. Often designers are brought into a project at an earlier stage and it is expected that they assist in defining a product strategy rather than solely defining a one off solution (Behrendorff et al., 2011).

The knowledge and application of design led innovation is rapidly becoming a foundational skill for design graduates all over the world. As this content continues to evolve so must design education and industry practice in its perception and engagement.

As design led innovation experiments with the traditional role of an Industrial designer, this new area remains not for everyone, student and industry. Yet as this theory and application is emerging as a new global trend in industrial design education, the opportunity is to capitalise on the establishment and opportunities granted – especially in Australia, there is current high demand for this new designer. Yet, the challenge still remains – to change the mindsets of educators, academics, design industry professionals and especially the design students in their attitudes and perceptions as to what exactly this new role involves and requires.

The recommendation from this study is that designers need to become experts in defining the design led innovation process and executing this new task. By setting a strong path with

clear objectives and measuring the intangible milestones of the project, the design profession will be one step closer to overcoming the issues outlined by practitioners and students. The key to overcoming these challenges will involve people skills not just design skills. The end goal is not to convince designers to become business leaders or to change who they are as designers, but to integrate the two so that they are able to communicate better with the business world.

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