union made

fostering entrepreneurial opportunities

This Thesis is submitted to Auckland University of Technology for the Degree of Master of Art & Design, (Product).

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Bacheleor of Art and Design (hons) [Product]

"Union Made" – June 2015

attestation of authorship –

I hereby delcare that this is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of a university or other institution of higher learning, except where due acknowledgement is made in the acknowledgements.'

– June 2015

acknowledgements

I would like to thank Dr Stephen Reay and Dr Enrico Tronchin who have graciously helped and given up their time to offer guidance in order for me to complete this research. I appreciate how you have both worked with me patiently as I dived into an area I previously knew very little about. The dedication you show to your profession has been a great example to me as I begin to look establish my own practice and pursue my career.

I would like to thank my friends and family who have allowed me to make space for this study and business, I know it has taken a lot of time from us being together, you are all very patient and understanding. There have been many missed dinners, holidays and surfs together, and I am looking forward to catching up on these in the future.

Nikolai Sorensen who I have had the privilege of working with on Trestle Union, thank you for diving into this with me and I am incredibly glad we did. The learning we have both made in the last two years has been hugely valuable and Trestle Union would not have happened without your drive and creative guidance. You made it happen and slaved it in the workshop even while I was away finishing this document. You are the only graduate from AUT product design to have established a business and successfully designed your own products to be sold locally and internationally before graduating. Your determination to pursue an idea is something to aspire to and hopefully by documenting this journey others will take courage to do the same.

The guys in the 3D Labs, thank you for your patience as I pursued this study. Your dedication to craft is a constant source of inspiration for me to develop a greater understanding of the material world around me. Thank you for putting up with my often distracted and distant presence, also the mess I made in the workshop while I completed this.

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abstract –

This research explores how product design graduates can use products they have designed as a vehicle to become more entrepreneurial, with particular reference to barriers and opportunities experienced by 'designer-maker' product designers in New Zealand.

Inspiration and ideation can dominate focus for product design graduates, with little support for design implementation.

Attempting to implement a product designed during post-graduate study the researcher discovered barriers as he pursued opportunities to implement the product. In order to better explore these barriers and opportunities faced during implementation, a case study involving entrepreneurial activities was pursued and documented by the researcher, a post-graduate product designer in New Zealand.

Along with the case study, a group of New Zealand Product Design professionals were interviewed in order to analyse their journey from study to the product design profession. The insights are described and brought together with the insights from the case study in order to explore the opportunities and barriers faced by product design graduates. Important themes include personal values, guiding principles and ideals as well as established relationships, collaboration and the ability to use whatever means available to implement a design. Alongside the design of a business and range of furniture these themes have been designed into two further outcomes, a guide and a proposal for a collaborative workspace in order to help the opportunities and barriers found. The two extra outcomes include a simplified booklet for post graduate students thinking about pursuing an entrepreneurial opportunity and a proposal for a test space to better aid product designer-maker students with workshop resources.

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introduction

Product designer, industrial designer, innovator – these terms may mean different things to people studying the same undergraduate degree; in my own study I am aware that I have made many assumptions about innovation, industrial design and the role of a product designer. I realized this after completing a major research project in my honours year. The long days and nights working through iterations of concepts seemed to pass quickly as the concept evolved into a prototype and then to what I would later consider a resolved product. Soon I was faced with almost daily questions from friends, colleagues and even people on the other side of the world: "What's next, are you going to produce them?" "Are you going to patent the design?" "Can I order one?"

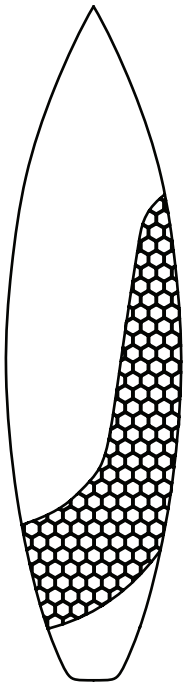
It was at this stage – when the celebration had finished, everyone had gone home, and I was left with what I call a premature product hangover – that I found myself staring over the edge of a large cliff pondering how I was going to get my product to a place called "the market" on the other side of a seemingly great divide.

Belsky (2013) of 99U, a conference focused on the mechanics of making ideas happen, often quotes Thomas Edison, "Genius is 1 percent inspiration, and 99 percent perspiration." They too believe the creative world has focused on idea generation at the expense of idea execution.

My Honours year research project, Clean Waves, explored the principles of sustainability as they relate to the sport and culture of surfing, with particular reference to the materials used in surfboard construction. The final prototype was deemed successful through the acknowledgement of awards and media attention, but the process of attempting to manufacture the product was incredibly difficult for both practical and personal reasons. The following year progressed by exploring opportunities and also entering design competitions for student work.

The surfboard design was a finalist in the International Design Excellence Awards, finalist in The Dowse Student Craft Design Awards, Gold in the New Zealand Best Awards (Student – Product) and First in the Australasian Student Design Awards (Industrial Design).

2010



2011

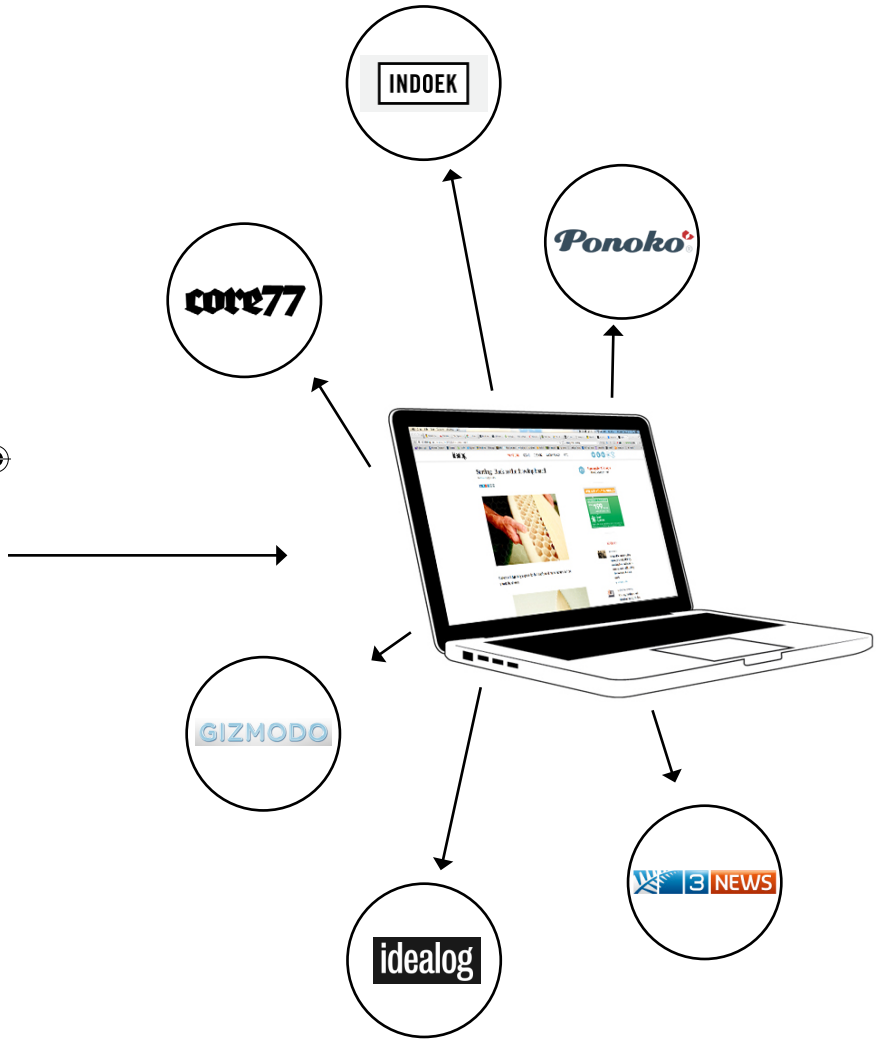
INTERNATIONAL DESIGN EXCELLENCE AWARDS '11
FINALIST

Gold.
Best Design Awards
Winner2011

AGOTYA
1st Industrial Design

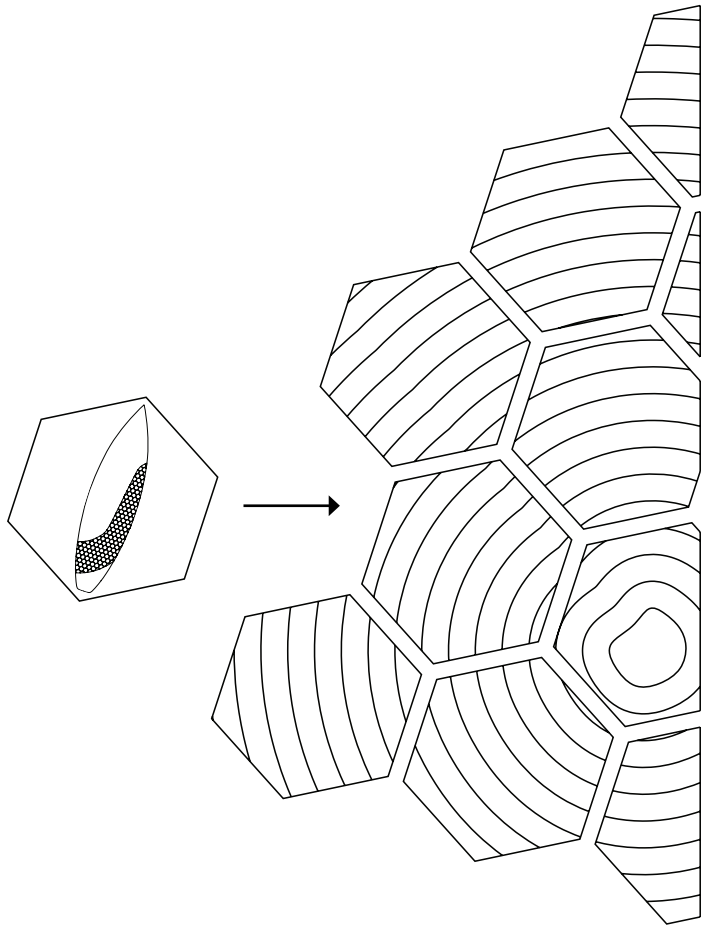
THE DOWSE
ART MUSEUM
Finalist Student Craft/Design Awards

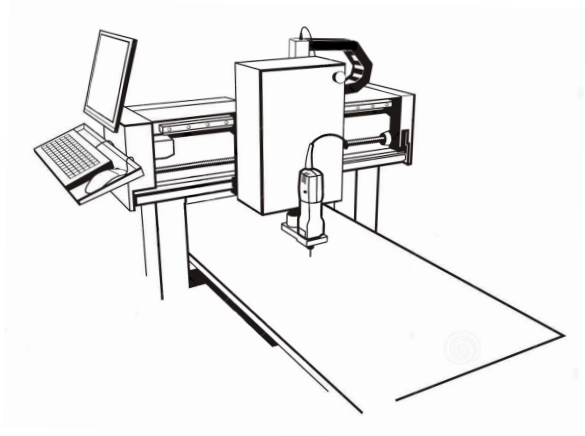
2011/12



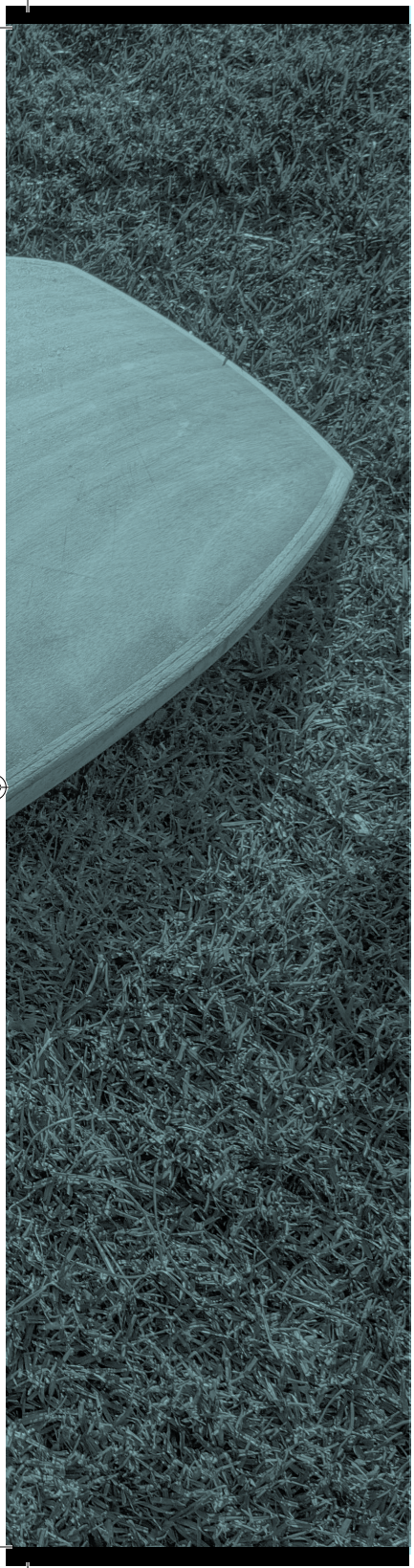
Exposure was gained through entering competitions, as the entries and results were picked up by blogs and online industrial design magazines. This exposure increased international interest and gave opportunities to travel and share the project.

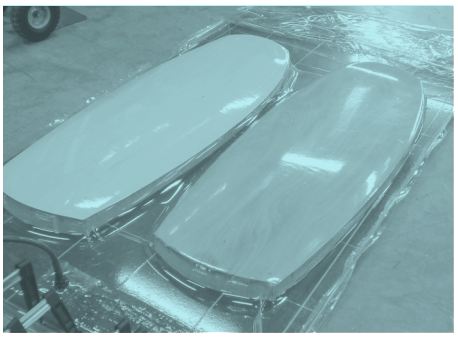
Much interest came from surfboard shapers in Australia, specifically the wooden surfboard community. I had not previously engaged with it, but an opportunity to participate came by an invitation to speak at the Currumbin Alley Wooden Surfboard Day on the Gold Coast, along with two other respected Australian surfboard shapers. This took place at Surf World, the Gold Coast Surf Museum. The opportunity gave further feedback on the design from those not only concerned with sustainable design principles, but also surfboard construction methods involving wood. Gaining feedback from other surfboard shapers using wood became of more interest as I attempted to validate the design through manufacture. Assessing viability, production time and costs became important, as these would determine what the final price for the surfboard would be; these were matters not previously considered during my design process.

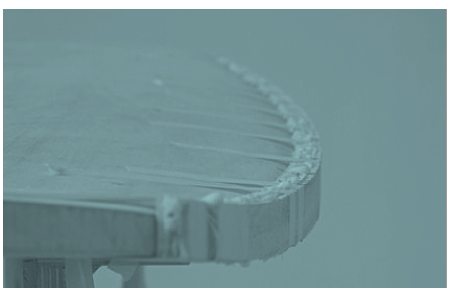




The chosen material, Paulownia, is a lightweight hardwood was not consistently available in New Zealand, which meant manufacturing had to be sought in Australia, where Paulownia was more readily available. This barrier increased costs and difficulty to the process, yet market validation was still pursued through contacts made within the surf industry in Australia during a previous visit. In 2012, following a series of emails and phone calls with a keen supplier/distributor and a local manufacturer on the Sunshine Coast, another trip was made to produce some more prototypes to establish the true cost of manufacturing in Australia. But the contact who was to fabricate the prototypes was ill and unable to meet. During early email conversations, it was decided that the complexity of the process I had developed required me to be there during the early stages of fabrication to answer the many questions he had about the process. The CNC process was an intricate series of programmed tool paths using up to 5 different CNC cutters and about 6 hours of machining. Early prototypes had taken up to 20 hours of CNC machining per board, but this had been refined to speed up production. Failing to meet with the fabricator and finish a prototype in Australia, I decided to reconsider my options in New Zealand.

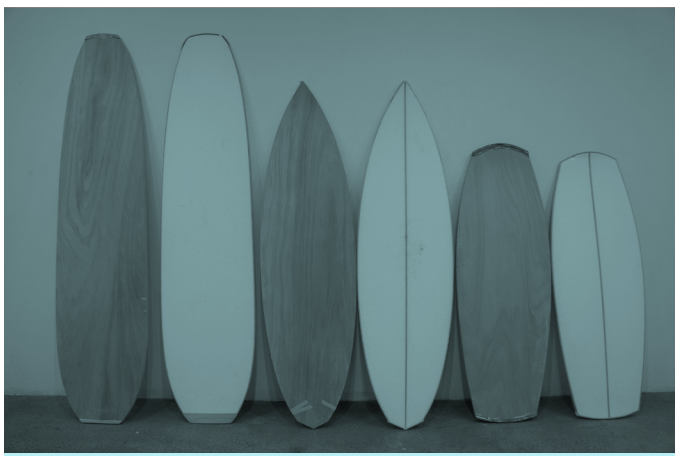






I decided to pursue a previous iteration, designed during the Cleaner Waves project. This was revisited for its faster production time and lower costs associated with the construction method. This method also used less paulownia, to help facilitate construction in New Zealand. Further prototyping and testing began during the summer of 2012/13. Two more surfboards were constructed using this technique to better test the durability of chosen materials.


LWR



Numerous people both in New Zealand and Australia had commented that, on seeing what I had done, they wanted to create their own surfboards. So to conclude the surfboard project for the time being I decided to invite two other product design students who surfed to create surfboards for themselves using the vacuum bag technique. This project was called Union Surf, an introduction to a more collaborative approach of investigating sustainable design principles in surfboard construction. Over the period of two weeks the two participants were asked to design their own surfboard shape; then they would be guided through the construction process, giving valuable feedback about the process and materials used should I decide to continue this project in the future.

UNION SURF

Toward the end of the 2012/13 summer, I was asked to participate in a documentary about exploratory approaches to surfboard shaping, in which I surfed one of the surfboards I was testing at the time. This took place at Maori Bay, on the west coast of Auckland.

A reflection was captured during the video interview when questioned the future of the surfboard developed during my honours year. The captured reflection articulates the idea that I the practitioner could see little value in producing a product for a small percentage of the market that could afford them, instead preferring to design, build and market a product for a wider community, and so having greater impact. Examining this reflection finds an assumption I made that the honeycomb surfboard would subsequently only be available as a luxury product, because of the high cost of production. It would not be a viable alternative for the majority of surfers, and so would have little to no impact on the consumption of current surfboards made from less sustainable materials. At the time I decided not to pursue the development of the honeycomb surfboard. Following this reflection I began to gain awareness of the complex web of potential barriers facing graduates attempting to implement their ideas. This includes financial resources, workshop resources, materials, personal design philosophies and values. The greatest of these seemed to be personal values and workshop space and equipment. The high investment cost of outsourcing production of such a complex product meant the only way forward was to build my own products. The idea that I design, make and market my own products is not new: after completing my undergraduate degree I was approached to sell all of the products I had designed and stock a local gallery with some of them. Due to my appreciation of working with my hands and making the work I design I have become familiar with the term designer-maker, which I had assumed referred to someone who designed, made and sold their own work. The barriers I had faced during this process of attempting to design, make and sell my own products may or may not be experienced by others. This prompted further questioning of the barriers and opportunities faced by other graduate product designer makers in New Zealand who seek to implement their designs.

Research Question –

–How can [product] designer-maker graduates more successfully engage in entrepreneurial activities through a design project?

Section 1

1. methodology

This chapter explains the chosen methodology and methods for this practice-based research project, first explaining the paradigms within which the project exists, followed by an initial outline of the research methods and design methods founded in chosen methodologies, showing the background structure that led the exploration of how graduate product designer-makers can use products designed during their study to successfully engage in entrepreneurial activities post study.

i. Paradigm

Paradigm

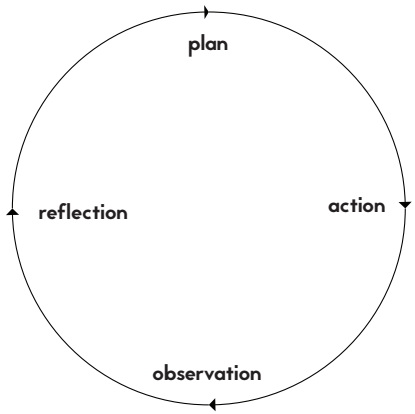
In research, the theoretical framework is sometimes referred to as the paradigm (Mertens, 2005; Bogdan, & Biklin, 1998). A paradigm may be defined as "a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research" (Bogdan & Biklin, 1998, p.22).

Interpretivist Mackenzie and Knipes (2006) state that "without nominating a paradigm as the first step, there is no basis for subsequent choices regarding methodology, methods, literature or research design" (Mackenzie & Knipes 2006, p.2). The task of finding a suitable paradigm today is far more complex, as the number of research methods available has increased dramatically (O'Leary, 2004). In Mackenzie and Knipes paper Research Dilemmas, they discuss some of the more common theoretical paradigms used today such as positivist (and post-positivist), constructivist, interpretivist, transformative, emancipatory, critical, pragmatist and deconstructivist.

Of these the pragmatist paradigm in particular has helped me align my research choices regarding appropriate methodologies, such as action research and grounded theory. Pragmatism supports a view where the process of knowing helps constitute what is known, or in other words, inquiry is action (Khalil, 2004). For pragmatists a fulfilled hypothesis is warranted rather than verified - while the hypothesis resolves the problem under focus, it invites indefinite revision and modification. So a pragmatist's reality is ever changing, based on actions (Morgan, 2014). This emphasis on actions and their consequences creates a gap between pragmatism and most versions of interpretivism because it does away with the idea that we are free to interpret our experiences in whatever way we see fit (Morgan, 2014). Instead our actions have consequences, and we build our lives around experiences that link actions and their outcomes. Pragmatism leads this research through multiple research actions, documenting their outcomes along the journey, these are the methodologies and methods.

As a practitioner involved in practice-based research I have chosen a methodology and methods described below as a background structure, where the exploration of graduate entrepreneurial activities and the journey to success or not by product design professionals are of key importance, rather than the products designed by either the practitioner or the interviewed professionals.

Fig 1.



Above:
Fig 1. shows the action research cycle

Action Research

A methodology particularly suited to the pragmatist paradigm is Action Research. Some have acknowledged a deficit between research and practice, but Action Research is a qualitative methodology that sees both research and practice working in unison (Collins, 2010).

Action research is a clinical research method first mentioned in the work of Lewin (1947). Action researchers do not see understanding and action separately; instead they argue that "only through action is legitimate understanding possible; theory without practice is not theory but speculation" (Huang, 2010). This thinking aligns with the pragmatist philosopher John Dewey (1859-1952) who calls the attempt to find reality outside ourselves or our actions a "spectator theory" of knowledge (Morgan, 2014). Baskerville and Pries-Heje (1999) argue that theory formulation is one area in which action research can be improved and that much of the literature on action research "currently assumes that theory evolution and exposition will occur as a natural consequence of problem formulation." Therefore, the integration of grounded theory techniques with action research serves to create grounded action research and improve the theory or, at least, conceptual framework formulation steps, as they are cyclically developed during the course of action research. Each action research cycle involves the following stages: plan, action, observation and reflection.

ii. Research Methods

Action Research

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Literature Review

Completing a review of a body of literature enables the researcher to better understand the main theories of the subject area and how they have been applied and developed. This includes the main criticisms in regard to previous research literature on the subject area (Hart, 1998).

This study will use the literature review for the purpose of tackling an emerging issue. Here the review of existing literature for the emerging topic is necessarily short, and I am focused predominantly on the fresh theoretical foundations proposed for developing a conceptual model (Webster & Watson, 2002).

Expert And Graduate Interviews

Interviews are an interactional communication process between two parties, one of whom has a predetermined and serious purpose, and usually involves the asking and answering of questions (Goyer, Redding, & Rickey, 1968). The interview process involves dynamic interaction with many variables, and also a degree of structure to help guide each unique interaction. The common elements of communication found in these unique interactions are perceptions, verbal and nonverbal messages, feedback, expectations and assumptions

(Stewart & Cash, 1997). A mix of these common elements was recorded via audio recording and note-taking during the interview process to sample and build an emerging theory as the interviews progressed. The participants chosen for interview were recent product design graduates, less than five years out of graduate study, and professional design graduates running their own design studio who graduated less than ten years ago. Following the iterative study design, the sampling process is driven by the emerging concepts, so as the analysis takes place, additional participants are chosen who may confirm or challenge an emerging concept (Lingard, Albert, & Levinson, 2008). The data gathered in the sampling process is largely driven by the central principle of constant comparison, as specific issues of interest are noted and later compared for similarities and differences. The aim is to move the research through the analytic process towards the development, refinement, and interrelation of concepts.

The data collected during the interviews was analysed via data mining software (TAMS Analyser) that allows the researcher to group data into codes, concepts, categories and aids in the development of the conceptual framework. This software is designed specifically for qualitative research with interviews, as opposed to observationally gathered data collected from the case study.

Case Study

Case studies are a common method of qualitative inquiry. There are many methods with which to study a case, but "as a form of research, case study is defined by interest in individual cases, not by the methods of enquiry used" (Stake, 2003) This research emphasizes the case study to draw attention to the question of what exactly is to be learned from the single case. Keeping this epistemological question in mind assists in designing the study in such a way as to optimize the understanding of the case.

Stake (2003) identifies three types of case study: intrinsic, instrumental and collective. Each of these differs in focus from particular to general, and are separated by combined purpose rather than a distinct line. This research aligns with the collective case study that is more instrumental than intrinsic, due to the case having a far more general focus on developing theory. Collective case studies play a supportive role in developing theory by allowing a broader understanding of issues faced by graduate product designers. In this research the case study is Trestle Union a business built to test design ideas/ concepts in an iterative way as they develop from concept and enter the market place to be sold/ implemented. The products will focus on simple easy to build furniture, as a way to help narrow the scope of concept design. Implementation of the product will firstly be through an online shop only, approaching further opportunities as they arise

in order to build a clearer picture of how product designer-maker graduates can more successfully engage in entrepreneurial activities through their design projects.

Reflective Practice

Reflective practice is helpful in providing a framework of inquiry for the research project by crossing the theory/practice divide (Jasper, 2003). Reflective practice is "thoughtfully considering one's own experiences in applying knowledge to practice while being coached by professionals in the discipline" (Schon, 1983). Shon introduced notions of reflection-in-action and reflection-on-action, the former sometimes being referred to as "thinking on our feet." This involves exploring experiences, being aware of feelings, and identifying theories in use, helping to establish greater understanding to inform actions during practice. This can also be linked to reflection-on-action, completed later, following the "action" (Smith, 2001).

The data gathered during the reflective practice may well be a valuable resource for others to reflect upon. The aim is to collate and edit the reflections made during this study into chapters to produce a hardcopy and PDF document available for those who may find it of use.

Collaboration

The notion that the complex problems facing society today can only be addressed effectively through a collaborative effort between individuals, educational authorities, governmental agencies, non-profit organizations, community networks, and business groups is gaining more and more support in the 21st century (Austin, 2010). Collaboration can be associated with many terms, such as joint ventures, consolidations, networks, partnerships, coalitions, alliances, consortiums, associations, conglomerates, councils, task forces and groups. Though it can be a complex and confusing term, it is important to come to a shared understanding to assess the efficacy of the collaboration. Gajda (2004) presents collaboration as a theory of how multiple individuals or entities work together together to develop a relationship; Gajda reinforces the complexity of collaboration, which represents a multitude of alliances. This understanding led me to include collaboration as a method and to take advantage of the opportunity to work with another product design graduate. I did so with the hope that the work would lead to deeper understanding of collaboration and gain me an added perspective from their point of view of design implementation. Most collaboration theorists contend that collaborative efforts fall across a continuum of low to high integration, with low integration being that of a network, where the focus is of the sharing of information and is relatively informal, and high

integration being that of a partnership, because its primary purpose is to cooperate by combining or developing mutual goals (Gajda, 2004).

The case study in this research project was a collaboration; to better understand this collaborative integration, the research uses Peterson's (1991) example of a three-point continuum of interaction for strategic alliances that moves from (1) cooperation, whereby fully independent groups share information that supports each other's organizational outcomes, to (2) coordination, whereby independent parties align activities or co-sponsor events or services that support mutually beneficial goals, to (3) collaboration, where individual entities give up some degree of independence in an effort to realize a shared goal (Gajda, 2004).

My use of collaboration in the case study aimed to open opportunities for the implementation of innovation and test design ideas/concepts in an iterative ongoing reflective way. Anderson (2008) writes that recognition of these opportunities is more likely to happen during the confluence of diverse entities, in other words, the added perspective of the product design graduate working alongside me would aid in identifying opportunities to implement our designs. It is for this reason collaboration is used to identify and engage in implementation opportunities to gain a greater understanding of the barriers and opportunities faced by graduate product designers seeking to implement their work.

My use of collaboration acknowledges that design often involves the collaborative help of others, instead of adopting the lone-genius model so often portrayed in simplified narratives about "rock star" designers (Shenk, 2014). By embracing the concept of the long meandering course of innovation (Shenk, 2014), the study also seeks to prioritize heroic cultures instead of heroic individuals.

iii. Design Methods

The following design techniques were used throughout this research as generative and evaluative methods to develop and refine design work.

Brainstorming

Brainstorming is recognised as a successful method of generating transformative ideas for testing (Rawlinson, 1981). It is a foundation method for ideation and when used in a social setting can be a complex social process (Wilson, 2013). IDEO, a respected process design firm, developed the "deep dive" method of brainstorming, an in-depth and lengthy brainstorm session designed to rapidly immerse a group or team into a situation for problem solving or idea creation (Moen, 2010). Brainstorming techniques conducted during practice, specifically the creation and development of Trestle Union, were drawn from IDEO. The brainstorming sessions combined design methods such as storytelling, identifying design challenges, and developing prototyping exercises. IDEO's "deep dive" ethnography was particularly useful as the practice was undertaken from the point of view of the subject of study, as I am a Product Design graduate in New Zealand.

Drawing

Visual representations such as freehand sketches are seen to play a significant role in design problem solving (Do & Gross, 1996). These marks made on paper form a partial record of the designer's thinking. This method is used to reason, make decisions, express ideas and evaluate proposals for further action. During the designing of products for Trestle Union, drawing was used to reason and also communicate ideas between the two participants involved, Nikolai Sorensen and I. The drawings were recorded on our own and in collaboration, often quickly and with whatever medium was at hand, usually a whiteboard or notebook. These methods relied on generating large quantities of ideas quickly and the practitioner noted that often graphic notation was not well suited to certain design problems. It was therefore used interchangeably with model making and prototyping. Thin wire was used to quickly draw in three dimensions and became a fast method of developing many iterations of otherwise tricky design details.

CAD

CAD - Computer Aided Design is the use of computer systems to assist in the creation, modification, analysis, or optimization of a design (Narayan, Mallikarjuna, & Sarcar, 2008). CAD was an important tool to finalize designs and gain accuracy in measurements that would otherwise require advanced geometry. The importance of

CAD as a tool for communicating ideas became increasingly relevant for interaction with the manufacturing industry, and enabled quick emailing of drawings and models for quotes and feedback on unforeseen problems. Although it was noted that people within manufacturing industry had extremely limited knowledge of CAD software, the drawings produced from either Rhino or Solidworks proved to be a useful medium for communicating ideas.

Prototyping

Prototyping is a pivotal activity in an iterative design process, enabling quick mocking up in three dimensions (Do & Gross, 1996). This enables the designer to better visualize and use the prototype to test and evaluate the design in terms of physicality, which is harder to examine in the earlier stages of ideation. Having a physical model present allows feedback and critique from users and other designers. The process also uncovers unforeseen challenges that could otherwise hinder the implementation process (Brown & Wyatt, 2010). The reflections from this evaluation would lead the process either towards a final prototype by way of further three-dimensional mock ups or, in many cases, back to rapid ideation using graphic language and CAD drawing. This became a turning point for many designs. These prototypes are known as necessary failures that lead towards a successful result (Myerson, 2001).

The use of the above design methods highlighted their cyclical relationship. Through the constant use of these design methods I have come to realize the importance of a beginning and an end in relationship to a fixed timeline for a period of design refinement, yet the cyclic nature of these design methods means the resulting design can always be further re-imagined and exists in an endless state of refinement.

2. literature review

iv. Designer maker

Searching for a clearer definition of the term designer-maker, I found a vague and hard to define expression used by artists and designers who are making their products with whatever tools they have. I firstly unpack my own preconceptions and how I have come to view the term.

Having an interest in both the design and manufacture of objects meant that making has been a large part of my practice to see ideas become products. Giving a body to an idea has involved experimenting with materials to gain a greater understanding of craft, material properties and manufacturing processes. This led me to think of myself as a designer-maker, someone who makes the products he designs. This status was largely due to a lack of financial resources to outsource production, and in turn has lead to a greater appreciation of what Immanuel Kant describes as the hand informing the mind (Tallis, 2003). This echoes the pragmatist creed that one learns by doing, or in F. C. S. Schiller's words where "experience is experiment" (Sennett, 2008). This ethos has been a by-product of my own making as partly necessity and partly enjoyment, where there was no other option but to design and make my ideas and concepts. In an effort to find a clearer definition of the term designer-maker, I looked for scholarly articles describing the use of the term, without success; but a web based image search returns a collection of photographs where a person is pictured in a workshop with an array of hand tools neatly positioned on the wall, usually wearing a leather apron while positioned near a crafted object they have designed and made themselves with the tools used in the background. The images lead to videos of designers making their products and seem more focused on the process as opposed to the product, while glorifying or even romanticizing the maker's process. This type of imagery has been seen as not-so-subtle messages reasserting the value of the handmade over the machine-made (McGuirk, 2011). At the same time it can be just fashion, especially with larger brands using the craft aesthetic to market their products, such as Levi's Craftwork marketing campaign, where young designer-makers and artists discuss their understanding of craft while wearing Levi's new range of denim (Levi's, 2011). The growing interest in handcrafted objects among young designers may seem to be driven by the ethos of action as inquiry, fashion or possibly necessity.

In "The art of craft: the rise of the designer-maker," Justin McGuirk makes a case for necessity, as "who else is going to make their work?" He writes of design as an increasingly popular career choice where opportunities to work with manufacturers are not growing at the same rate. He also presents the idea that, before the Recession, "a select few designers could sell their work in art galleries," but now "the

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Show Atelier – Rosanne Bergsma (2014) Pinterest.
Retrieved from https://www.pinterest.com/pin/223773293736610 76/

SupaDupa.me (2012) Amanda Li Hope – Jewelry Designer Maker.
Retrieved from https://vimeo.com/42045543

Spread:
Collected images from an internet search for the term 'Designer Maker'.

ConnectEd Studio (2014) Vimeo Retrieved from https://vimeo.com/88824488

market has replaced the notion of the designer as artist with a humbler proposition, the designer as craftsman" (McGuirk, 2011). This view aligns with my own experience of designing and making my own products and forms my understanding of the term designer-maker. This is neither artist nor craftsman but instead a designer who partly defines their role by their increasing involvement in the process of creating and implementing their own products.

Product design graduates may not identify with the term designer-maker, or the newer term design entrepreneur, but it is useful to this research to better define a group of product designers who design, make and may likely engage in entrepreneurial activities to continue designing and making their own work. This correlation between the designer and the entrepreneur has been sighted in Hoover and Heltzel's Kern and Burn: Conversations with Design Entrepreneurs (Hoover and Heltzel 2013). Hoover and Heltzel interview designers who identify themselves as design entrepreneurs, giving light to a connection between design and entrepreneurship.

Below:
Advertising from Levi's Craftwork campaign.

Levi's Craftwork n.a Creative Boys Club. Retrieved from http://www.creativeboysclub.com/levi%E2%80%99scraftwork

v. Entrepreneurship

Piecing together an understanding of entrepreneurship, I found it an evolving conceptual term, hard to pin down with a definition. The etymology of entrepreneur shows the word is derived from the French entreprendre, translating as between taker, or go-between, the verb meaning to undertake, implying that the definition is rooted in action, giving it meaning through practice as opposed to the purely theoretical (Merriam-Webster, Merriam Webster, 2013).

The wide breadth of definitions available in literature recognise the importance of entrepreneurs in society, and include a range of narrow and broad definitions. Most of these appear in the context of business economics and management, with early definitions defining entrepreneurship narrowly as the fourth factor of production, someone able to transform a new idea or development into a successful innovation (Gunes, 2012) (Schumpeter, 1942). These narrow definitions also see it as phenomenon of small business rather than large, usually associated with private sector rather than public, social or not-for-profit sectors (Lowe & Marriott, 2006). Broader definitions include all sectors of business but also recognise the potential of the employee to innovate within a larger organisation, while also beginning to appear in wider contexts and disciplines such as engineering, design and the arts (Gunes, 2012) (Zeithaml & Rice, 2005).

American Economist Israel Kirzner outlines the entrepreneur as one who generates action from the opportunities found in disequilibrium (Kirzner, 1999). Similarities are seen between this definition and the role of design where the product designer is to create and execute design solutions for problems of form, usability, physical ergonomics, marketing, brand development, and sales (De Noblet, 1993). Kirzner (1999) speaks of action coming from the opportunity found in disequilibrium, while IDEO outline the design process, where problems or opportunities motivate action and the search for solutions (IDEO, 2015). The parallel between definitions of the entrepreneur and designer give light to the question put forward by Alter (2013): do designers make great entrepreneurs? Alter (2013), quotes Steve Jobs (2003) on design:

"Design is a funny word. Some people think design means how it looks. But of course, if you dig deeper, it's really how it works." Alter then goes on to point out that it goes a level deeper, "Design is not just about how it works, it's about the process of how you get it to work. And that's what founding a company, what entrepreneurship is all about" (Alter, 2013). To define design in this way broadens the scope of the role of the designer and includes the implementation process that is important to this research. The expanded role of the designer in this definition is not purely seen as an agent or service provider, instead a founder or part of a founding team with a collective vision to spawn innovative products (Alter, 2013).

vi. Innovation

Innovation is defined as a new idea, device or process, that "breaks into" the market or society (Frankelius, 2009). Products that make it to market and into greater society help to manifest the true value of innovation (Schendel, 2007). Yet it seems in most cases that innovative ideas will never be realized as successful products, with estimates suggesting that only 1 of 3000 such ideas will successfully make it to market (Stevens, 1997).

This shows that idea generation is insufficient and there is a need to explore how innovations can be successfully implemented to truly innovate (Datta, Reed, & Jessup, 2013). Despite this widely recognized need, a review of the available literature does not reveal an integrative framework (Datta et al., 2013). Commonly used terms in the literature include "innovation systems" and "innovation ecosystems" and, although these seem to be emerging concepts, the terms are generally used to emphasize and define interaction between the ecology of actors contributing to innovation.

This concept of the innovation ecosystem is useful to help map and articulate these complex relationships to see where graduate product designer makers or design entrepreneurs would operate within a larger ecosystem of innovation.

Innovation Ecosystem

The term "innovation ecosystem" implies an analogy with a biological ecosystem observed in nature. A biological ecosystem is defined by Merriam-Webster (2014) as:

Complex system of living organisms, their physical environment, and all their interrelationships in a particular unit of space. An ecosystem's abiotic (non-biological) constituents include minerals, climate, soil, water, sunlight, and all other non-living elements; its biotic constituents consist of all its living members. Two major forces link these constituents: the flow of energy and the cycling of nutrients.

The analogy is important to this study as it recognizes the complex interrelationships within a biological ecosystem and similarly how this complexity exists within the conceptual innovation ecosystem. Although the focus of the research is a specific innovation ecosystem involving graduate product designers in New Zealand, the recognition of the greater context and relationships is important because every part of an ecosystem has a functional effect on the other parts (Jackson, 2012).

The following mapping of this innovation ecosystem is crucial to understand the broader context of where graduate product designers in New Zealand are positioned and how seemingly successful product design graduates interact within this ecosystem.

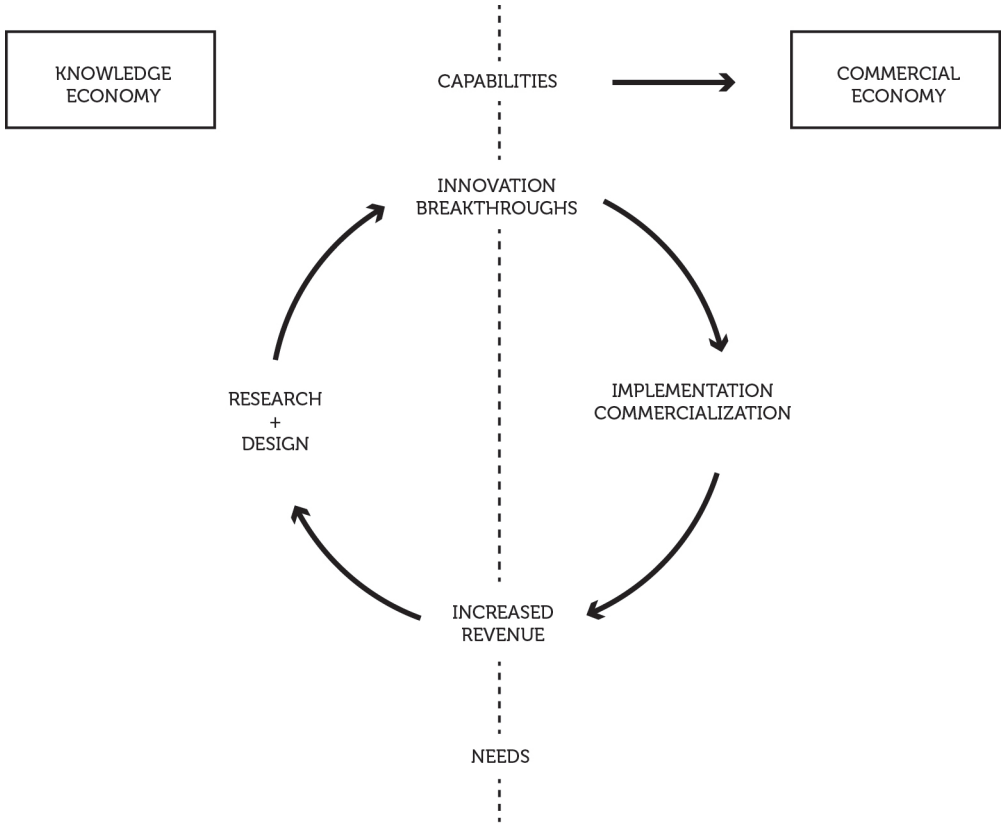


fig 1. innovation ecosystem

Fig 1. shows the intersection of two distinct but largely separated economies: the knowledge economy driven by research and the commercial economy driven by the marketplace. These two are linked through the cycle of resources invested in the knowledge economy that are derived from the commercial sector which are ideally replenished by the innovation-induced profit increases in the commercial economy (Jackson, 2012). When these two economies reach a balanced equilibrium, the innovation ecosystem is deemed to be healthy.

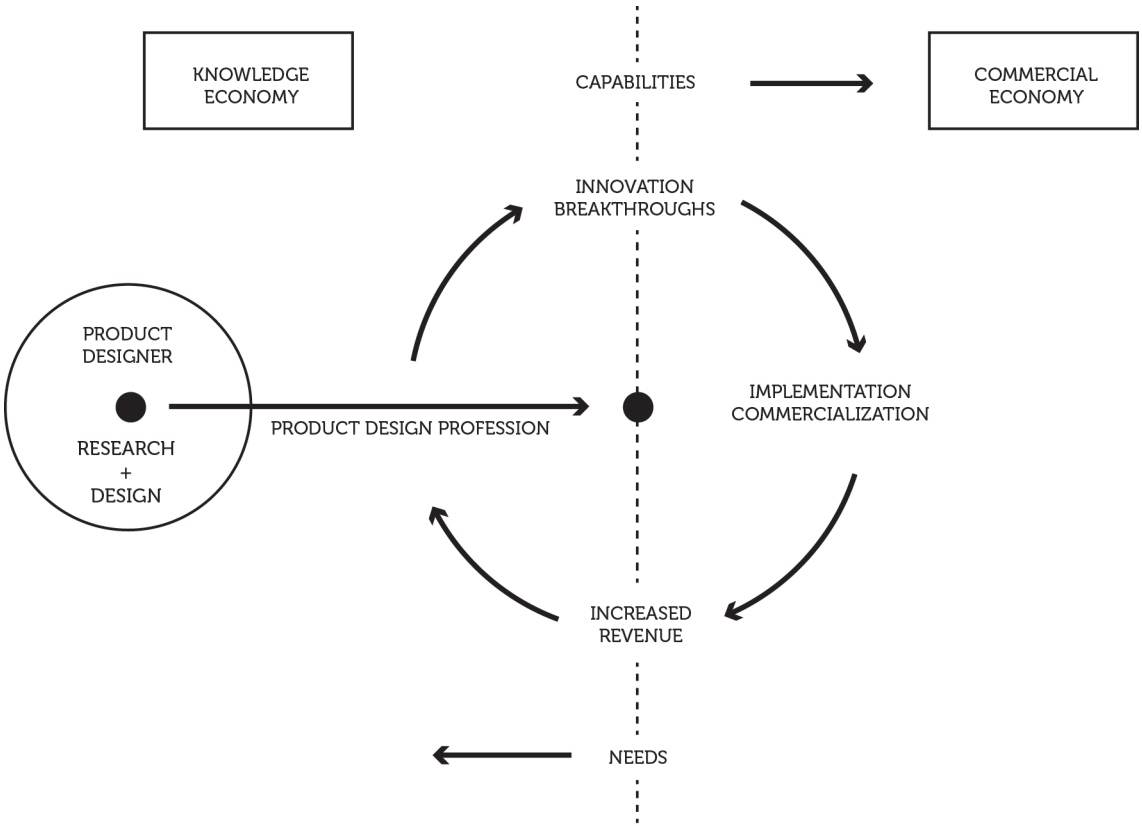


fig 2. product design graduates in innovative ecosystems

Fig 2. shows graduate product designers positioned initially in the knowledge economy and the potential shift as they graduate and move into a professional role to contribute within communities of innovators, entrepreneurs and businesses (the commercial economy).

Hendy and Callaghan (2013) argue the importance of these communities because if New Zealand is to grow its economy more rapidly it must overcome its small size and low population density to build nationwide communities of innovators, entrepreneurs and businesses (Hendy & Callaghan, 2013). Similarly, in the New Zealand innovation case studies of Winsley, Gilbertson, and Couchman (2001), innovation is seen as the key to progress for society, and to truly harness innovation requires the unleashing and empowerment of the creativity of people and organizations. As graduate product designers begin to understand their role within this innovation ecosystem, what opportunities are available for them to test and implement the potentially innovative ideas they have designed?

vii. Innovation hubs for designer makers

This chapter reviews past and emerging incubators of innovation ecosystems relevant to product design graduates in New Zealand to give an overview of the potential breeding grounds for entrepreneurial activity and review the small amount of relevant academic literature available. The chosen examples are designer-maker focused.

New Zealand has seen hubs of innovation based within the designer-maker community in the past, namely Cicada Studios in Hawke's Bay and EON Design in Auckland, both of which have faded out of existence, and attempts to find out more about these proved to be inconclusive. Information found showed Cicada Studios as an incubator set up for graduates of design schools specializing in furniture design, under the guidance of David Trubridge, William Jameson and Ross McKay. Notable designers who went through this studio include Tim Wigmore, David Moreland and Kennedy Brown, little more information was found. EON was a store in Auckland that specialized in interior design and stocked products designed in New Zealand by design professionals and design graduates. Although it was not an innovation hub, it created opportunities for local designer-makers to sell their work and, in some cases, provide employment for designer-makers. EON provided bespoke furniture and lighting design for clients, using creative graduates to help with this. Sadly there is limited information available on these two creative hubs, insufficient to expand on the extent of their involvement with product design graduates in New Zealand. There have been innovation hubs or opportunities for designer makers in New Zealand but it would seem they have not lasted longer than 10 years. The question of why these have not lasted long is important but outside the scope and time constraints of this exegesis.

Looking at the current growth of innovation hubs internationally, it would seem that emerging innovation ecosystems are challenging the rules of manufacturing and intellectual property protection, largely due to the availability of low-cost digital fabrication and open-source ideas approaching the physical realm (Troxler & Wolf, 2010). One particular emerging innovation ecosystem to embrace these ideas is Massachusetts Institute of Technology (MIT)'s fabrication laboratories, or "FabLabs."

The FabLabs emerged from MIT's Center for Bits and Atoms alongside what is known as the "maker movement." Gershenfeld, who helped make the FabLabs a reality, makes the case for a digital revolution driven by the democratization of digital methods of manufacturing, allowing people to digitize the physical world rather than just the virtual. (Gershenfeld, 2012) FabLabs' early outreach involved a kit of $50,000, spent on a laser cutter, 3D printer, and a couple of computer numerical controlled (CNC) milling machines, with the rest of the money going on materials.

In an early example of a FabLab project, a group of girls attended the South End Technology Centre of inner-city Boston in 2003, where they designed a high-tech craft market, learnt new technology, expressed themselves, had fun and earned an income from the market. FabLabs now number in the hundreds and have spread across the world. There is one in Wellington, New Zealand, and the practitioner attended the opening at Massey University during the Fab8NZ Conference in 2012. Opened by Gershenfeld and Massey Industrial Design lecturer Chris Jackson, the FabLab aims to "give individuals and small firms access to technology, but also help them make connections between disciplines and industries, and that should be a catalyst to more innovation in New Zealand" (Massey University, 2013). Reflection on this visit and informal discussions with staff led the practitioner to question the potential for FabLabs to truly function as an innovation ecosystem, as it seemed that they are weighted in favour of the knowledge economy, with little emphasis on commercial economy crossover.

FabLabs represent a recent addition to the growing "maker movement" and show desire within the academic community to share and give greater access, both globally and locally, to digital fabrication technologies. This democratization is partly due to the falling price of these technologies, allowing access to expand from corporations, governments and elite Institutions to research groups, university departments and smaller companies (Tanenbaum, Williams, Desjardins, & Tanenbaum, 2013). It seems the logical end of this progression will be the availability of these technologies for individuals. This trend was seen previously in the area of computation where in 1975 the first personal computers were released to a generation of computing pioneers (Gershenfeld, 2012). Of all the digital technologies, 3D printing has received large amounts of media attention recently and is now available to home users on a small scale, leading to a wider understanding of the technology and the ability to rapidly prototype. This can be seen as an important step for digital fabrication technologies and also product design graduates. As digital technologies become more accessible, they further democratize both design and manufacturing practices, allowing greater opportunity for graduate product designers to gain access to equipment previously restricted to well-funded professional designers and researchers (Tanenbaum, Williams, Desjardins, & Tanenbaum, 2013). Given that product design graduates now have greater access to some of these technologies, enabling them to prototype and test new designs at home, do the FabLabs and Hubs of Innovation provide more than just production level machinery for experimentation? Do any of these Hubs help facilitate the implementation of the designer's work? Could the use of these hubs be an opportunity for

product design graduates to test market viability?

Looking to a recently established innovation hub for answers, a good example is found in Autodesk's Pier 9. AutoDesk, a major software development company, have created an innovation workshop where they have placed high-end production level fabrication equipment in a large workshop on a pier overlooking San Francisco Bay. It seems Autodesk has embraced the idea championed by Gershenfeld (2012) that the digital revolution is not additive versus subtractive – it's the ability to turn data into things and things into data:

> The interface between software and hardware is becoming more important to how people design and make things, and thus more important to our business. Deeply understanding this connection requires hands-on experience. We have many high-end, production-level machines because we expect even consumer-level hardware to very soon have extremely sophisticated capabilities... We want to create a place to demonstrate and showcase the things we make, be it software, hardware, or ideally, the combination of both. (S. Martin, 2014, n.p.)

To put their software to good use, Autodesk have created Pier 9, an innovation workshop overlooking San Francisco Bay. The facility is closed to the public but available to Autodesk employees and selected artists/designers/makers who get to use the facility to manufacture. The facility includes a digital fabrication lab, a woodworking shop, a metalworking shop, a 3D printing lab, laser cutting and printing capabilities, an electronics workshop, an industrial sewing centre, a commercial kitchen, and multiple project-specific areas (S. Martin, 2014, n.p.).

For Autodesk it is the understanding of these technologies and the software driving them that opens opportunities for innovation. As S. Martin notes in relation to Autodesk's Pier 9, "While it is extremely rare that production-level tools are available in a non-production environment, it is just this type of environment that fosters innovation." (S. Martin, 2014, n.p.)

With regard to the advancement of digital fabrication technologies and the growth of funded FabLabs, the focus seems weighted in favour of a broader knowledge economy, with little mention of commercial application and accountability. Autodesk's Pier 9 is a great example of a company centred on enabling people to design and innovate by educating them in the use of commercial software and hardware to design conceptual products. There is generosity evident in this model of an innovation hub where the artists in residence receive free training/use of all available resources for four months, twenty-four hours a day, seven days a week access, a $1500 per month stipend, plus a materials budget and retention of all intellectual property and physical work. All this is in return for showcasing the capabilities of Autodesk's suite of

Metropolis Magazine. n.a San Francisco Pier 9. Retrieved
from http://www.metropolismag.com/Autodesk-at-Pier-9/

Above:
AutoDesks Pier 9 Innovation Workshop

software and hardware by publishing their work on Instructables.com, and making a presentation at the close of the residency. They've created space where they "intend to explore and push the boundaries of our software and hardware tools, and to create an environment where people try and succeed in doing what is currently thought impossible" (Sass, 2014, n.p.).

This generous model would suggest that Autodesk see design and innovation as the realization of ideas into physical objects -- prototypes. This has helped highlight the differing focuses of innovation hubs, building a better picture of potential gaps in the development of incubators and how they can aid product design students seeking to implement their ideas.

As noted above, the Autodesk and FabLab approach to innovation does not seem to address commercialization as part of the execution of the idea, instead leaving the intellectual property and products created during the residency in the possession of the artist/designer. This approach embraces a broader definition of design as articulated by one of Autodesk's artists in residence, Wei Li: "design is not only a tool for problem-solving, it can also be speculative, to ask questions and challenge conventions" (Flaherty, 2014, n.p.). She believes that design is not necessarily about creating a "better" experience, rather, it's about pushing the boundaries of what an experience can be. The explorative nature of Pier 9 has no concern with commercial gain from the artist/designer communities' work itself, but rather the process by which they go about creating their work using the interface between software and hardware from which Autodesk generates revenue. This relationship seems mutually beneficial, yet once the artists/designers have finished the residency and no longer have access to the equipment used to create their work, they may find it difficult to continue in their explorations without the use of high-end, production-level machines.

If execution is the multiplier of innovation (Perlman, 2013), then this is a great opportunity for artists and designers to exploit processes and advice that could potentially be out of reach, while executing ideas that may otherwise have gone unrealized. It would seem Autodesk leave the problem of how the artist/designer would like to produce further work up to the individual, as they are in the business of commercializing the tools used to make ideas a reality as opposed to implementing the ideas created.

Ultimately it seems the responsibility still rests with the designer to drive and execute their ideas/products should they see this as an important step in the progression of their products. This highlights a potential barrier where space and workshop equipment are needed by graduate product

designers in New Zealand to create products for market validation.

The following questions were generated before, during and after my literature review, feeding into both my case study and interviews as I continue to explore how graduate product design students in New Zealand can use the products they design to successfully engage in entrepreneurial activities after they graduate.

How can the temporary use of a workshop aid the market validation process for graduate designer-makers in New Zealand, in order to provide a pathway to implementation?

How have other designer-makers in New Zealand begun to implement their own design work?

How do commercialization goals influence the design process of a business, brand and the products made?

How do New Zealand product designers identify themselves as entrepreneurial?

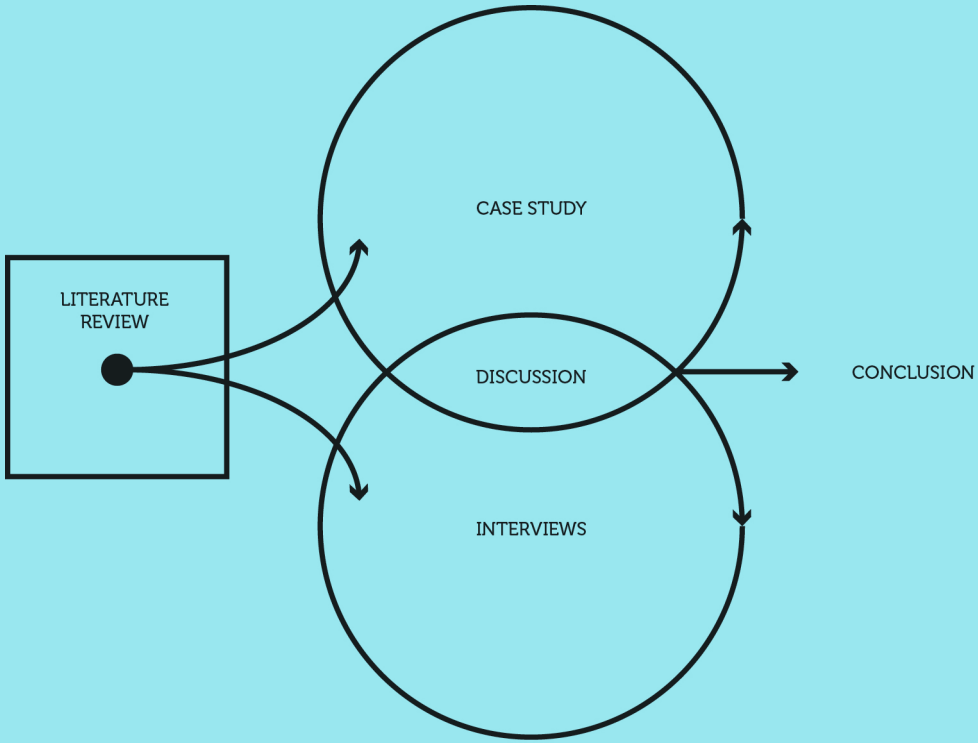


fig 3. research methods from literature review to conclusion

viii. New Zealand examples of designer maker commercial activities

Douglas and Bec is a design studio and store, designing and making furniture and lighting in Clevedon, New Zealand. Bec Dowle started the business with her father Douglas Snelling; they were later joined by Bec's husband Paul Dowle. Douglas makes all of the furniture and lighting by hand in his Clevedon workshop with help from some local artisans. Since starting in 2006 they have grown to produce a substantial range of furniture, lighting and homeware products. This is a great example of designers starting out and doing what they could with what they had, i.e. using opportunities available to them and growing a successful design practice. It seems the collaboration between Bec and her father has really used the skills at their disposal to create something unique, built around their love of design and making. In this instance the uniqueness of the collaboration is seen throughout the products they produce, from the hand-crafted joinery and considered material choices to the greater sense of a curated range of pieces that work equally well on their own as they do together in-store. These unique aesthetics of the Douglas and Bec products are designed but also effects of the processes at their disposal, making the products truly Douglas and Bec and also a design practice that would be hard to replicate. The danger for young designers who are inspired by other successful New Zealand product designers, such as Douglas and Bec, is the tendency to see their inspirations as the goal and try to replicate what they see, when they themselves have unique perspectives and opportunities available to them. This sentiment was expressed during one of the expert interviews.

"Our skills I think are in being quite aware of what we're good at. I think this is very important as designers. It can be dangerous to have a model of a designer that you think is what you'd eventually aspire to, eventually you are not going to be good at being that person."

Douglas + Bec. (2012) Douglas + Bec for Kate Sylvester. Retrieved from http://thedesignfiles.net/2012/10/douglas-bec-for-kate-sylvester/

Above:
Douglas and Bec - assorted products

Simon James, another Auckland based furniture designer, began his design practice after learning the importance of how designers and manufacturers best work together during his spatial design degree at AUT (South, 2013). This convinced him to begin Simon James Design, fourteen years ago, and outsource the production side of his business to a network of manufacturers who were skilled in specific disciplines. James still works with some of these manufacturers. Now the practice has grown to the point where he exports to cities including New York, London and Shanghai. Here in New Zealand nearly three quarters of the firm's customers are larger organisations including BNZ, AUT, Victoria University of Wellington and Air New Zealand. There are now three parts to his business: Simon James Design, the Simon James Concept Store and Resident. The Simon James Concept Store is a retail brand that began as a pop-up shop. This has been a good way for their brand to test the market locally. Resident is an export focussed company that makes chairs and lighting. It was formed in 2011 to champion New Zealand-based manufacturing and to produce "iconic, practical and dependable products" (South, 2013). This approach to design and manufacture is clearly one that requires more capital investment when starting out and may be out of reach for many students immediately graduating from design education. But these examples of New Zealand designers venturing into business highlight the idea that they have applied the design process to business to design a platform/business from where they can keep designing products. This implementation of the design process to business shows how it can be transferred to a wider set of problems faced when looking to implement a design. Even as I look to implement my own design work, these inspirational examples show that designers can be successful in the pursuit of implementing their work in New Zealand, and Auckland in particular.

Simon James Design. Hex 750. (2014) Simon James Design for Resident. Retrieved from http://bestawards.co.nz/entries/product/hex-750-brass/

Above:
Simon James - Hex 750 Brass light

3. case study

ix.Trestle Union

To observe the barriers and opportunities of graduate designers attempting the implementation of their work, I approached a design opportunity with the view of validation through commercial implementation.

A potential barrier for designer-makers graduating from product design courses in New Zealand was identified following the implementation of my Cleaner Waves (2010) research. The barrier involved a lack of available resources and workshops for creating products to test commercial implementation without investing large amounts of capital. This lack highlighted an opportunity for a case study in which the Auckland University of Technology (AUT) workshop was used to market-test a simple product range of trestle furniture.

The opportunity involved the development of a product range with an undergraduate product design student. To test this opportunity, we decided to formalize the experiment by starting a business. To embrace the full spectrum of learning available in moving from idea generation to idea implementation, this became a formal partnership through an incorporated company called Union Made. This name best described the partnership and nature of the collaboration. Union Made became an overarching brand, giving room for the trading name Trestle Union for the trestle style furniture produced.

The case study was set within a time frame of one year's use of the resource to build the products and test the market.

Barriers of implementation

-High cost to prototype

-Technical manufacturing process

-Lack of workshop space to fabricate

-Expensive machinery needed in order to fabricate

-Large amount of investment capital required

-Materials hard to source in New Zealand

An opportunity to explore idea generation and implementation as a graduate product designer in New Zealand was highlighted by requests from friends and family for simple furniture with clean lines at an affordable price. I had made some trestle tables for friends and requests grew the more I made. I was approached by Nikolai Sorensen, who was receiving requests for some trestle legs he had designed. This seemed like a good opportunity for both of us to collaborate and explore the implementation process of some products we had designed.

-Simple low cost product

-Easily accessible materials

-Agreed after-hours use of workshop space

-Opportunity to design a business

-Low investment costs

-Fast production time

-Easily outsourced if needed

Aims/Objectives

-Design a business to take simple furniture through design generation and implementation to better understand the barriers and opportunities faced by graduate product designer makers in New Zealand.

-Repeat the process of designing and launching a product within the business to test platforms of online shopping and social media available for graduate product designer makers.

-Assess learning outcomes to provide key points for others to follow.

-Compare findings with expert interviews undertaken during research.

x. Action cycle 1

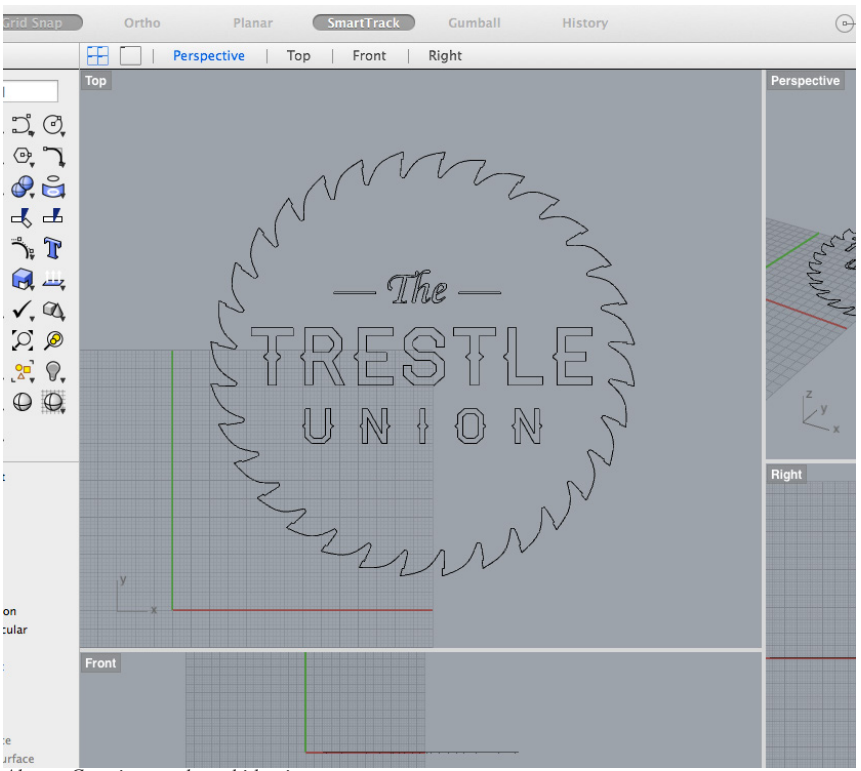
A Lot to Learn

The scope of the opportunity for our product lay in the arena of furniture designed and made in New Zealand, between the ideals of quality design and affordability. The tension between these ideals had been reflected in the development of the honeycomb surfboard of Cleaner Waves, helping to highlight the important inclusion of personal values in the design of products for an intended market. Nikolai and I felt the exclusivity of products designed and manufactured in New Zealand was largely due to price, putting these quality goods out of reach for many people and denying them the benefits of such goods. This allowed space to put forward concepts as to what could be an offering at a mid-market price point that was on trend and well made.

Brainstorming began to position the practice and paint a clearer picture of how to shape the case study as to what avenues were most applicable to students in our situation. This process resulted in a vision much bigger than our immediate capacity, but allowed us to align our approaches and agree on the direction we would take.

This process took place over the first two months of study, meeting each week to sit down and share ideas through a fast process of mapping out thoughts and concepts for product direction, materials and construction methods. Next, a suitable branding strategy was needed. This was derived from our own personal tastes in furniture and design.

Upon reflection of this process, there was an

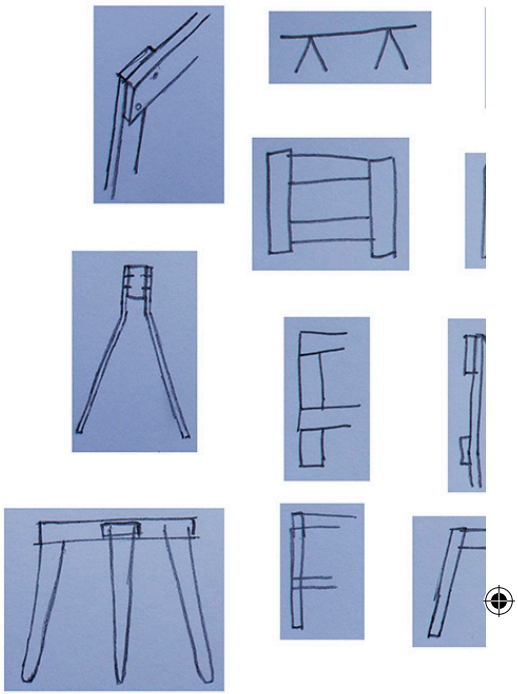


Above: Creating our brand identity

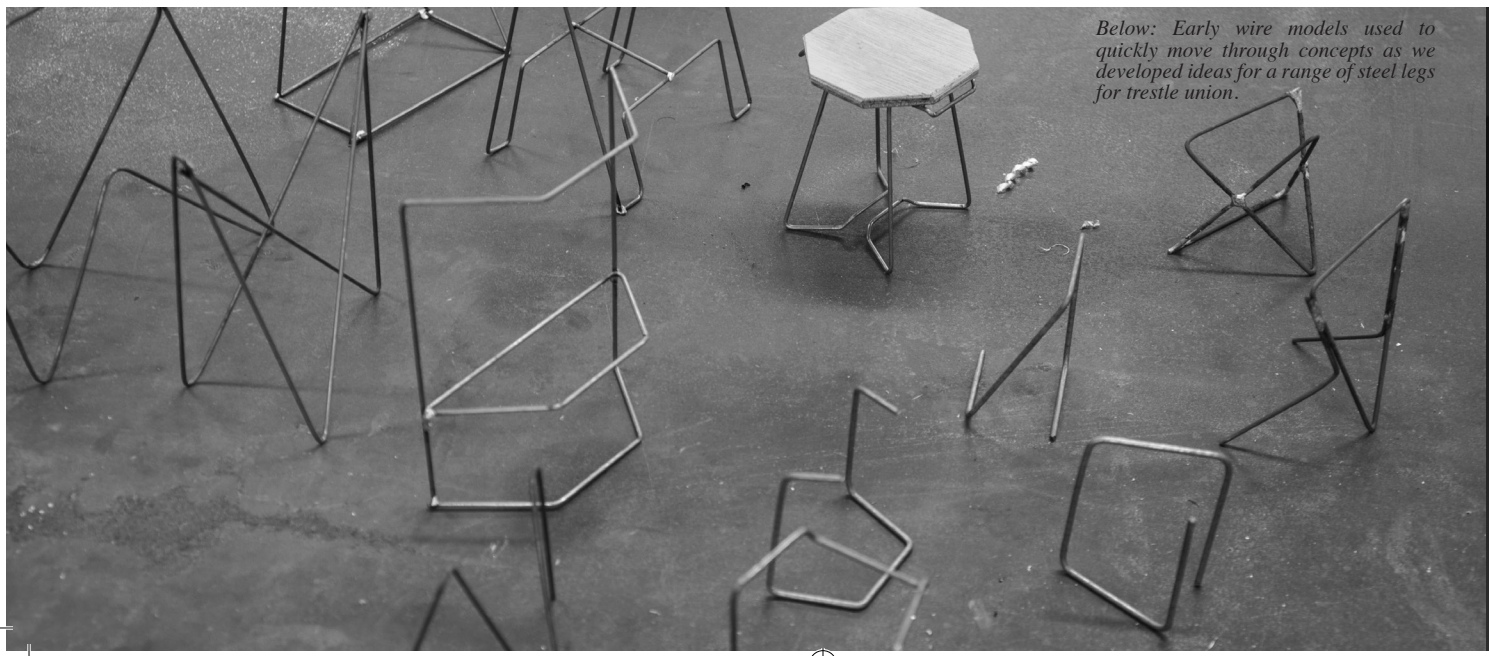
incredibly enjoyable aspect to building the brand identity. The direction was specific and seemed to emerge naturally from our mapping and envisioning of where Trestle Union could head. There was no consultation with branding strategists or branding literature. We drew on tacit knowledge gained from observation of respected brands that we connected with individually. Although this process can be studied in branding literature, the natural development of our brand highlighted a key insight early on, where both practitioners had a clear idea of how to communicate our identity visually through online and print media. This emerged as a key element for us, and one that seemed to have relevance to other New Zealand graduates investigating the possibility of producing their own products for market. Trestle Union was not used as a prescriptive method for creating a platform; instead it was used as a method to analyse the process of two graduates stepping out to contribute to the design and development of products in New Zealand.

Right: Concepts, models and prototypes produced by both practitioners during early development of Trestle Union.

Illustrating low cost manufacturing approach to Trestle Union with brand, identity and goals.

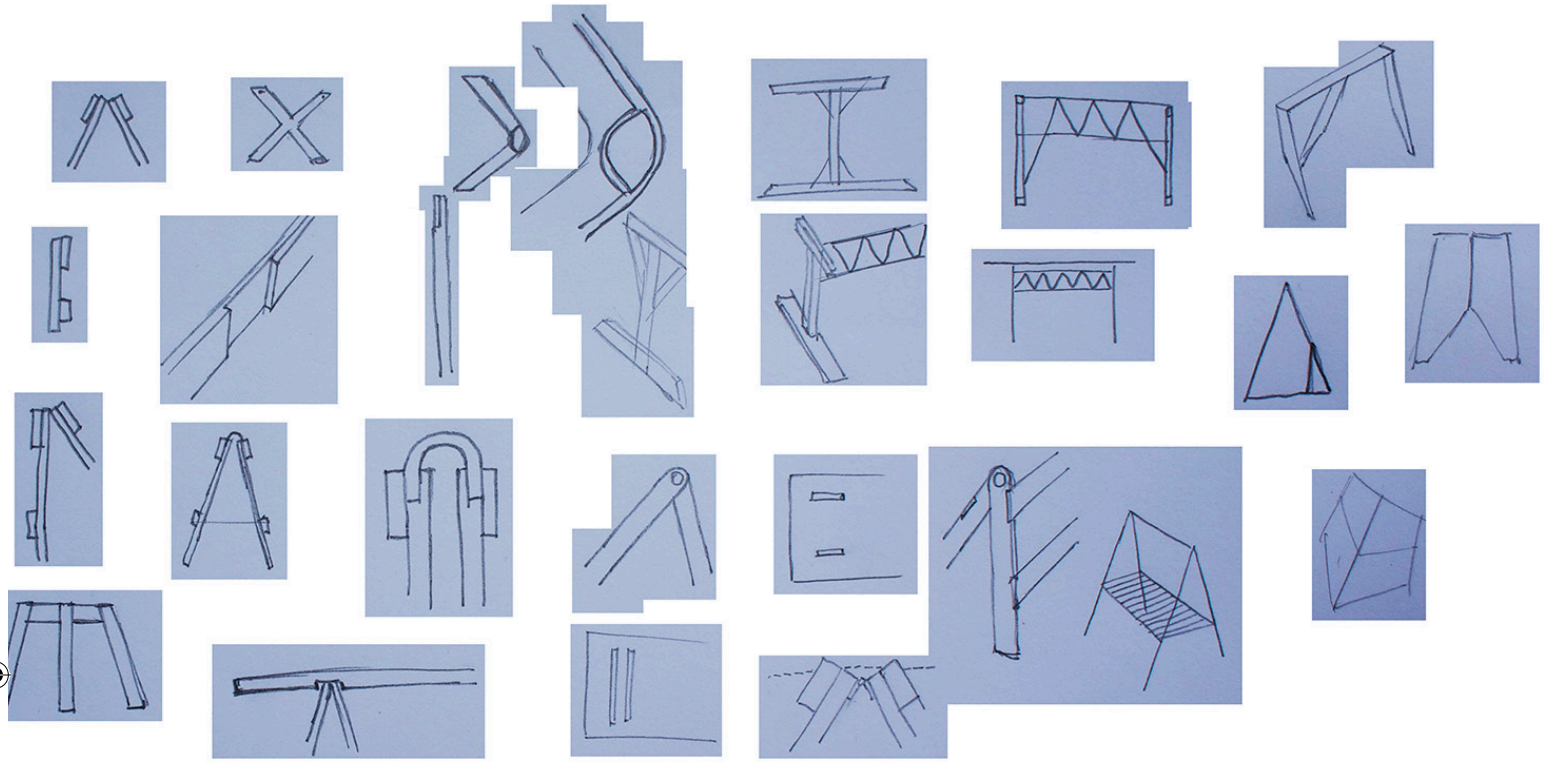


Creating a common understanding between both partners in relation to product direction involved a process of shared ideation, sketching, modelling and prototyping. Working through details in a shared manner was a new aspect for both designers, who continued to produce design work individually, outside Trestle Union. This collaboration brought about stronger ideation in the limited time frame available, with both Nikolai and I critiquing and combining knowledge in multidisciplinary areas including, but not limited to, software, web development, media contacts, industry knowledge, materials and construction methods.



Below: Early wire models used to quickly move through concepts as we developed ideas for a range of steel legs for trestle union.

Below: Wi
Sorensen, w
likely to be u

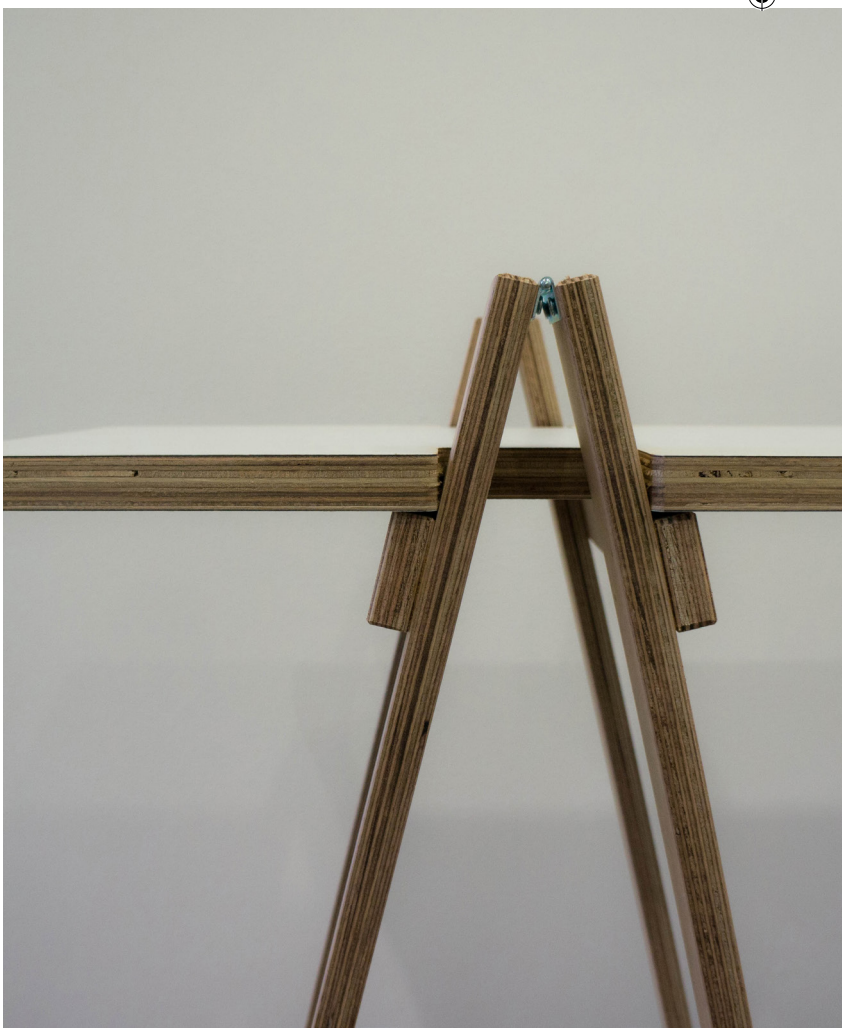


Wire prototype by Nikolai
en, we found the 4 legs were too
o be unstable on uneven ground.

Below: An early steel prototype that very labour intensive and expensive to post.

Below: Wire legs prototype that took up too much legroom and again to large to easily ship.

Below: Hair pin legs trestle, compactable design yet the style was not inline with the aesthetic we wanted to carry forward with trestle union, as it was too similar to other designers work.



Prototypes and material testing during early iterations of products for Trestle Union.

Large amounts of time were invested in discussing these key components, which involved dialogue between Nikolai and myself and meeting with friends in the furniture industry who we thought could offer advice and guidance in the early stages.

When conceptualizing the products and brand with others, I reflected that the meetings were with previous acquaintances made by either of the practitioners. This was largely due to a history of trust and respect for their work that became a critical element in choosing whom to approach and listen to. Although there were other avenues we could have explored, these were natural connections already made through established friendships and acquaintances. An element of trust existed here, allowing easier connections to openly share concepts and ideas to receive constructive criticism. Not being well-connected or not having the ability to easily build relationships within a wider design community could be a barrier to those starting out; we noted our tendency to approach established connections with whom we felt less vulnerable. This highlights the importance of relationships built while studying, working or attending design events, something that could potentially influence the successful development of concepts into resolved products for the marketplace.

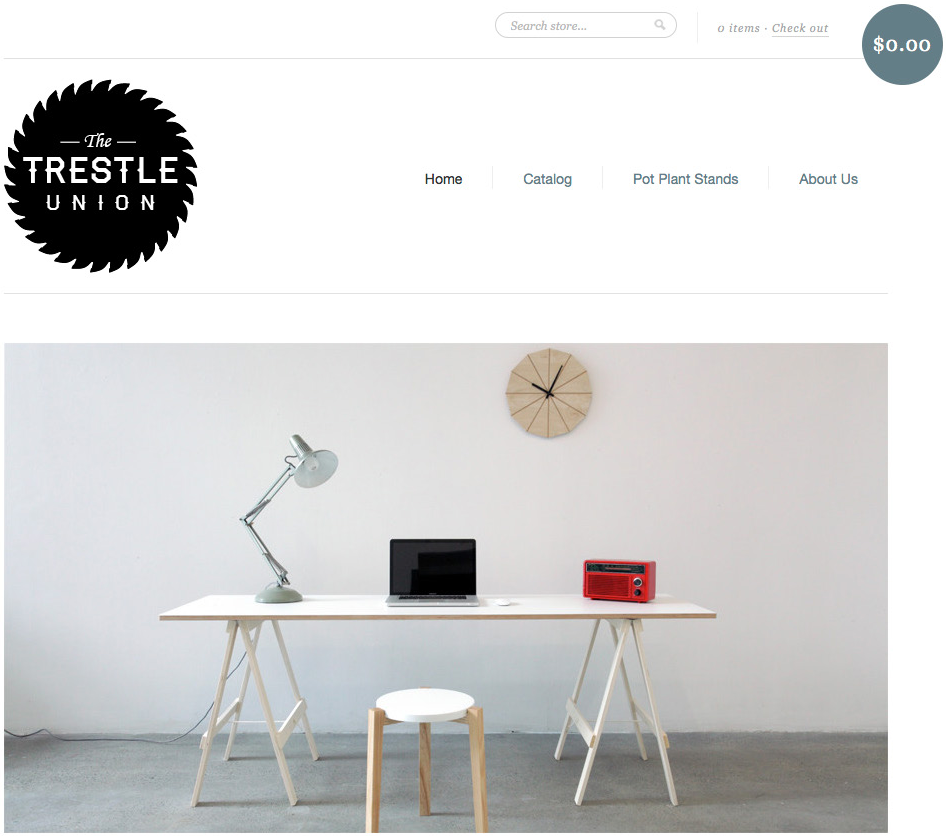
Left: The first product shot of early table d esign became the opening page to our website

70

xi. Action cycle 2

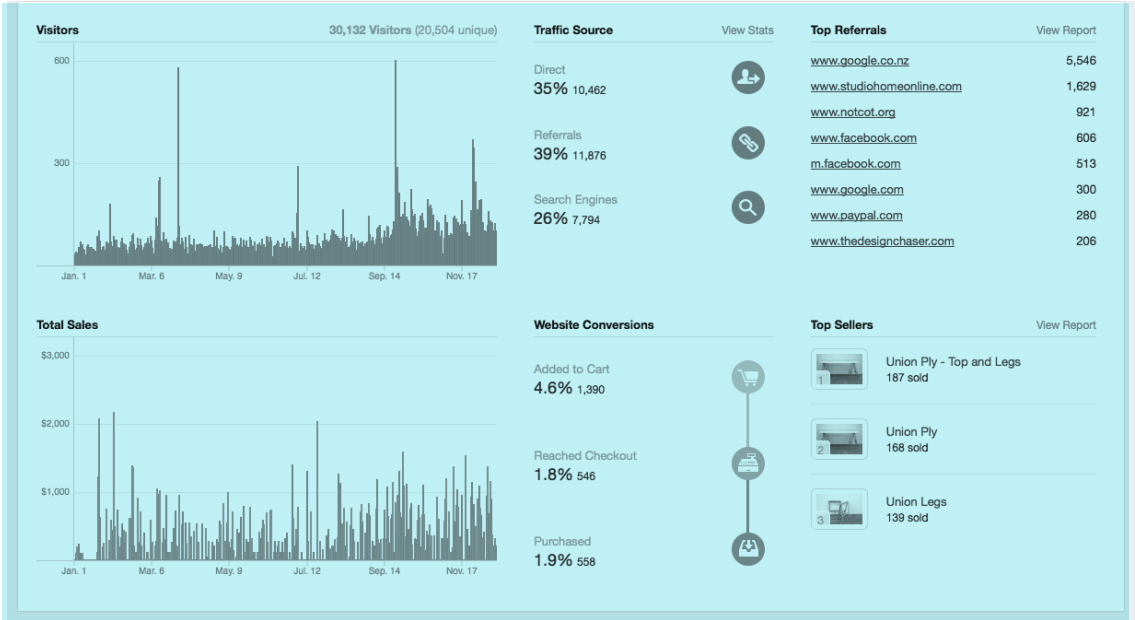
Reaching Out

As I had no established retail connections, initial contact was made through the creation of an online store. Reflecting on the growing acceptance of online shopping, this was an ideal marketplace to test the product range without needing to invest in bricks and mortar. We had limited web-design skills between us and began by using an online platform for around $30 a month. Although this removed some of the control from the design process, it proved to be a perfect application for quickly and easily managing an online presence with well-designed and developed interfaces. Most e-commerce sites now offer multiple templates that are easily customizable and great for collating data, including visitors to the site, traffic sources, referrals from other sites, sales, orders and inventory.



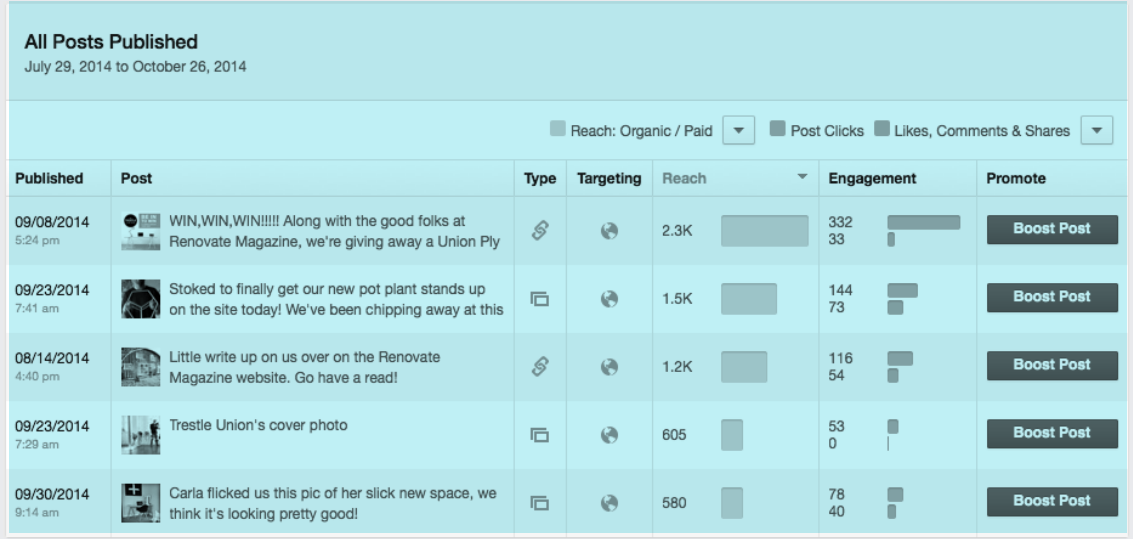
The design of the site was a rapid development from a free template chosen to best suit and represent the products and brand. This allows anyone wanting to test a product to have a shop front to take orders, freeing time to focus on other areas. This step was crucially important to the development of Trestle Union.

Although the web domain and site were acquired two months prior to launching, it took about a month of being live to receive our first order. Initial reach was only friends and family and a surprising amount of organic search traffic through search engines. Having a website does not mean it will show up in internet search results, even if the stock product is searched for. Search engine optimization is a critical part of being visible and the strategic move to include key product terms in the trading title and site allowed an accelerated ascent up the rankings. We began a process of "link building" through other websites, the power of which was highlighted through frequent email enquiries received by Nikolai, who had posted a previous trestle design on his personal website, highlighting demand for and lack of products in this style. Further links were added through personal websites and Tumblr pages, followed by contacting design blogs and asking them to publish Trestle Union's story and give further exposure. As the number of links grew, so did our visibility. This online presence was a key element for early exposure that was largely driven by our intuition and ability to assess opportunities. Later reflections have aided the construction of a clearer strategy for building an online platform with which we now have a voice to communicate design work to a wider audience.



www.trestleunion.co.nz website traffic and sales statistics for one year

Seeing an overview from the second year of trading shows the increase in data collected and the flow-on effects from product launches and social media activities. The collection of this data was provided through the online store interface. Although this looks impressive and thorough, we reflected that the web traffic data was less frequently viewed and analysed as the case study progressed and only some specifics were of key interest. These included referral websites, social media engagement, and monthly and quarterly sales overviews to track growth.



All Posts Published
July 29, 2014 to October 26, 2014

Reach: Organic / Paid | Post Clicks | Likes, Comments & Shares

Published	Post	Type	Targeting	Reach	Engagement	Promote
09/08/2014 5:24 pm	WIN,WIN,WIN!!!!! Along with the good folks at Renovate Magazine, we're giving away a Union Ply			2.3K	332 33	Boost Post
09/23/2014 7:41 am	Stoked to finally get our new pot plant stands up on the site today! We've been chipping away at this			1.5K	144 73	Boost Post
08/14/2014 4:40 pm	Little write up on us over on the Renovate Magazine website. Go have a read!			1.2K	116 54	Boost Post
09/23/2014 7:29 am	Trestle Union's cover photo			605	53 0	Boost Post
09/30/2014 9:14 am	Carla flicked us this pic of her slick new space, we think it's looking pretty good!			580	78 40	Boost Post

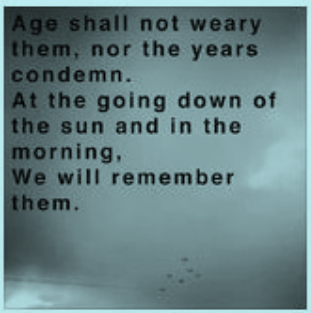
Trestle Union facebook statistics

The correlation between social media followers and web traffic became of interest as we began to track our reach through sites such as Facebook. In two instances we deliberately used this platform combined with Instagram to communicate. The spikes in website traffic show engagement with potential customers and the follow-on effect of increased daily web traffic. This process was not prescribed but experimental; both practitioners reflected on how this style of working may be suited to certain graduates but not to others. Both practitioners used social media, especially Instagram, to follow and search for interesting brands and individuals. Instagram was a familiar platform for both of us, one that enabled Trestle Union to communicate easily and effectively with our audience.

Trestle Union Instagram feed

May 2014

April 2014



March 2014

February 2014

These insights from selected social media helped guide future discussions about how our social reach and visibility could affect our growth. Our online platform provided a cheap alternative to the bricks and mortar retail space that, not so long ago, product designer-makers were forced to accept to reach an audience. Operating from this domain at first gave Trestle Union the opportunity to sell direct to customers and to keep prices affordable by removing the retail mark-up. Due to pursuing this strategy our social engagement became hugely important.

We made extensive observation of a number of other designer-makers who had begun online and then set up a retail space, as opposed to starting with the physical space and then operating online. This highlights the trend towards online shopping as an important opportunity for product designer-makers to initially connect with an audience, but we found online success is largely dependent on one's willingness to engage with social media platforms.

This natural ability and desire to engage with these social platforms on a personal level allowed the practitioners to engage with a much wider audience without a middleman. We received immediate feedback in the form of followers or likes and we able to correlate data on shared images and stories with sales and engagement. This was documented best through the use of Instagram.

Left: Trestle Union Instagram feed

Left: Opportunity to work with blogger Julia Atkinson of Studio Home to develop some pot plant stands

xii. Action cycle 3

Embracing Opportunity

As stories about Trestle Union began to appear in the media, further connections were made with similar brands and other product designer-makers. These opportunities gave us important exposure to much larger audiences and readerships.

This was an important milestone for Trestle Union as the brand now seemed to be gaining its own momentum. Other brands began approaching us with ideas, and contact with industry was well and truly made as the wheels began to turn.

Interaction with brands and media working within similar design aesthetics, target audiences and locations allowed Trestle Union to gain relevant insights from other practitioners. These connections were mostly created through built relationships, and evolved far more naturally than they would have had we gone through a business incubator. An attempt was made to connect with a business incubator, but this plan was hampered by time constraints and available meeting times for both practitioners.

The practitioner does not doubt the benefit of using business incubators but, upon further reflection, feels they can act as an additional barrier, due to the seemingly contrived nature of incubators' offerings. These no doubt are helpful to many businesses,

List of brands we have supplied products to and developed custom products for.

but the case study revealed the importance of the pursuit of available opportunities. The uptake of these opportunities grew in number, placing Trestle Union in the position of choosing openings that aligned with our values and perceived direction. In turn, the opportunities led to the development of new connections and relationships, revealing further insights through interaction. This cycle of opportunities, connections and insights has added momentum to Trestle Union and allowed us to improve as a business by learning from our peers. Insights revealed in this way seemed to reinforce values already held by the practitioners, while developing an approach to design implementation that is constructed in line with these values.

The practitioner recognizes that this approach places the designer at the core of the design implementation process to implement in a way true to previously developed values. Expert interviews will aid in the exploration of this insight as an important factor to recognize when guiding entrepreneurial product design graduates in New Zealand. Simultaneously the realization was made that the potential for a sustainable business operating outside the AUT workshop was a leap into the unknown – adding another layer of challenges to tackle.

The space provided at AUT proved to be a huge benefit in terms of applied learning during the Trestle Union case study. As the practitioners realized the case study was leading towards a larger business, strategic moves were made to outsource fabrication of products. Accounting for this possibility allowed the product pricing to remain static, although production costs increased, and the rent of a workshop space had to be covered. Searching for suitable spaces involved a number of factors, the main being cost, as sustained growth was still uncertain. Discussion of possible scenarios led to the fixing up of a disused family-owned barn. The aesthetic feel of the old barn suited the brand well and, given the family link, rent was much cheaper than other options.

The following pages show the visual documentation of collaborative projects with other brands and also the development of a new workshop.


SUNDAY ☘ BREW
CHEMEX POUR OVER
TARAPUNA
18-22 HURSTMERE RD
FROM 10AM
SUNDAY 1ST SEPTEMBER
WE GOT A SOME BEANS FRESH FROM
THE FAR AWAY LANDS OF PUNAETA AND COLOMBIA
BOTH ARE SINGLE ORIGIN - AND THE CHEMEX POUR OVER,
HIGHLIGHTS THE SUBTLE AND UNIQUE FLAVOURS
THESE COFFEES HAVE TO OFFER.
COARSE GRIND
MEDIUM-FINE GRIND
POUR THE HOT WATER
ENJOY
HUPPER
ALLPRESS

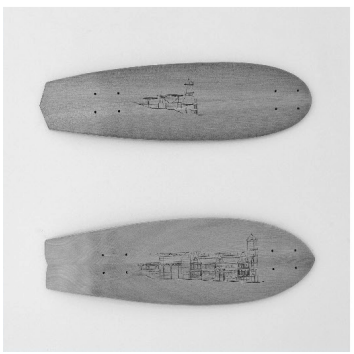

ON THE
TABLE
Can't find it?
WE'LL MAKE IT!
THE OUTLET STORE
NZ MADE
Exquisite pieces of Italy

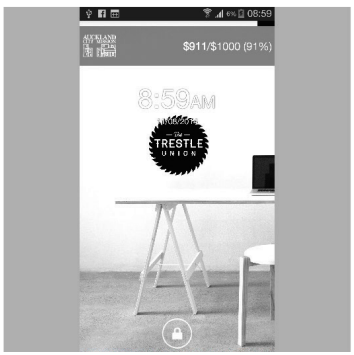

Libby & BEN
creative
BRANDS


creative talent
FROM THE LANDS DOWN UNDER
THE TRESTLE UNION
APRIL 26, 2013


Lewis Frederick's


Lewis Frederick's

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8:59AM
THE TRESTLE UNION


2014
JAN 1


The New Zealand Herald

Search keywords...

National Video Opinion Business Technology World Sport Entertainment

10 Favourite Things: On the table

By Zoe Walker

5:00 AM Friday May 01, 2015

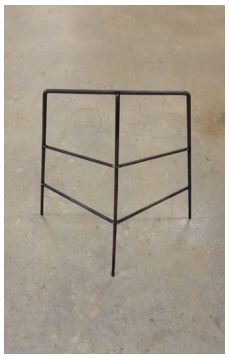
Design & Garden Home Life Viva At Home ...

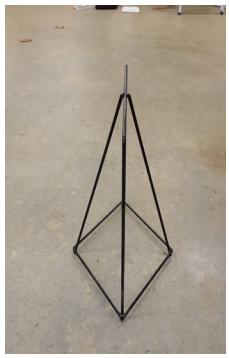
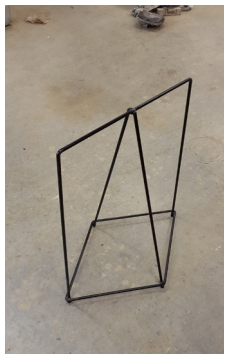
The founders of Trestle Union tell us about their top things, from an old T-shirt to a radio constantly tuned into Kiwi FM

Facing page: shows collaborative projects with other brands.

Below: Creation of workshop space



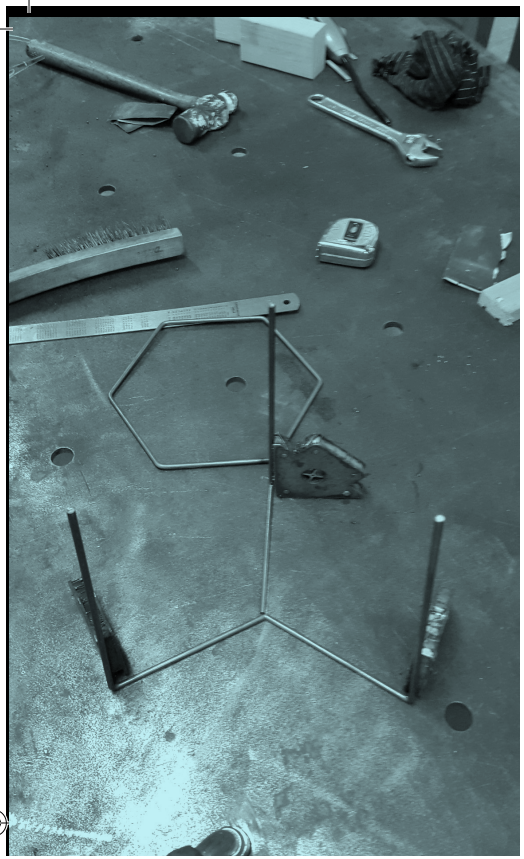



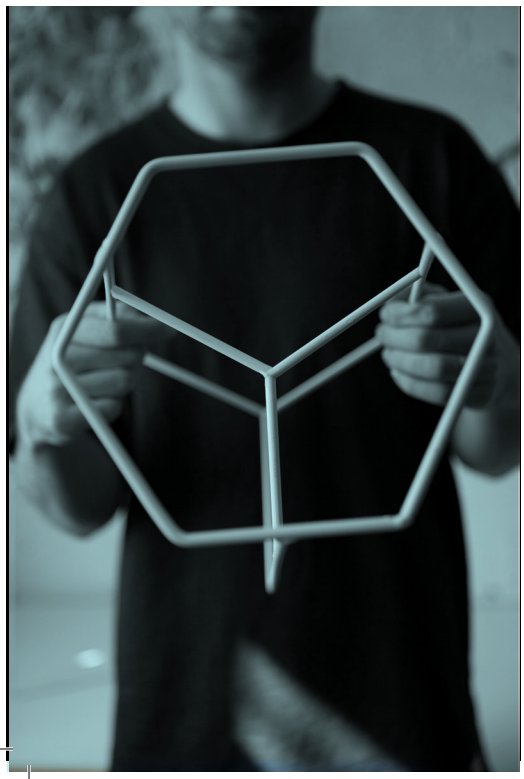




Above: Second iteration of Trestle Union trestle legs developed

Left/below: Steel legs and macrocarpa tops designed for Arkade Hire





Pot Plant Stands developed by Trestle Union with Studio Home


TEAM.WORK
studio home
+
TRESTLE UNION

xiii. Action discussion

Moving Forward

Reflecting on the case study has given me a greater perspective when looking ahead to unrealized possibilities. Key reflections made during the case study include insights predominantly applicable to product designer-makers intending to commercially implement their designs. Key reflections include:

The importance of the Designer's core values to be recognised and made a central component when seeking to implement the design.

The designer's natural abilities and strengths should be defined and used as shown with social media engagement during the case study. This became a strong component in the success of the case study. Our ability to communicate through social media helped drive our sales while launching new products and increasing website traffic.

As Trestle Union became more visible, reflections were made on the various avenues used to gain momentum and exposure. These came through relationships, built either with others who could advise on our approach or with existing connections made through active participation in the local creative community. These connections happened naturally through like-minded friends mixing in similar circles.

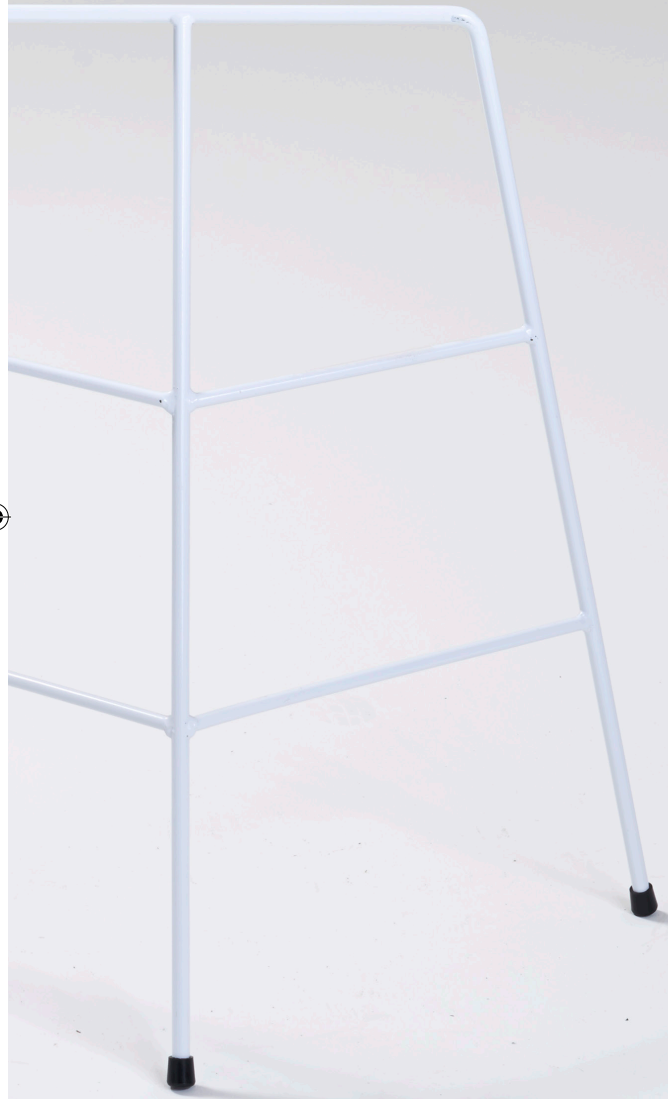
Above: Trestle Table produced by Trestle Union

One large barrier was overcome through the use of the AUT 3D-Lab workshop, us of which was allowed for the first year of the case study experiment; after that, further market testing and production needed to be done elsewhere.

When starting an experiment such as Trestle Union, recognition needs to be made of the prior commitments of both practitioners. All work was done outside normal office hours and considerably long working weeks were endured before seeing many results. This large investment of time also made meeting with possible business incubators and mentors a barrier.

Right: AUT 3D-Lab Workshop


ALUMINIUM FILES ARE HELD IN THE OFFICE
FILES
HACK SAWS
AUT 3-D LAB
PHILIPS SCREWDRIVERS
RING SPANNERS METRIC
RING SPANNERS IMPERIAL
CHROME VANADIUM
FORGED ALLOY STEEL



The early success of Trestle Union gave my collaborator Nikolai Sorensen employment immediately following graduation, enabling a seamless transition from study to self-employment. The growth of the business come through collaboration with other designers and also the ability to design, fabricate and sell. This understanding has enabled both of us to learn a considerable amount about the realities of moving through idea generation and implementation. This learning has flowed on to more recent products released toward the end of this research.

Left: Steel trestle legs produced by Trestle Union

xiv. Where to from here:

Vision

Drawing to a close with my Master's and looking ahead is the next opportunity. Both Nikolai Sorensen and I, after long hours on Trestle Union, now weigh up where to head with the business, considering our changing lifestyles.

Producing handmade products using quality materials at an affordable price for a larger market is a careful balancing act with tight margins between expenses and profit. We chose to do this as it aligned with our own ideals and values. The challenging side of this vision is that as the business grew we needed more cash flow to expand. Not wanting to increase our prices for our customers meant we would need to increase sales instead. In turn increasing production and we found the labour involved in making was keeping us from designing more products. So the balance between designing and making while holding to our vision is a balancing act we are very aware of. Due to the demand of labour and admin we began working in the business more than we worked on it, this impacted our ability to design, the thing we enjoyed most. After outsourcing the following product iterations we are quickly learning this is the best method to help us free-up time and focus on what we do best.

Partnership

The combination of Nikolai and I shaped Trestle Union and brought about the products we sell. Nikolai has decided to take a job at a local manufacturing company, Systema, working in a design role.

Both of us feel the need for more experience, working outside our own business to learn and be mentored. Ideally we would like to keep Trestle Union going and are currently exploring options to outsource even more of the business to free-up time. This is an important step that could see us fold Trestle Union for now or keep it going by taking some risks and using our capital to employ others to help. I think it's a worthwhile pursuit.

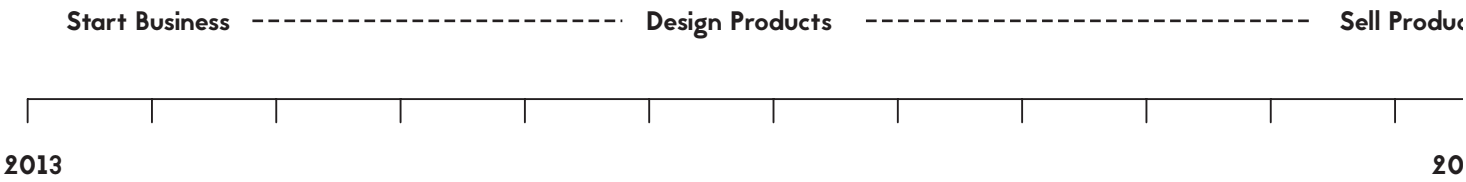
We have created value in our customer base and feel it would be wasteful to let this go. So we will return to the basics of what we are about, trestles, surfaces and supports: the essence of what we do. And if we need to change the materials or processes by which we provide these then we are happy to experiment with this.

Cashflow

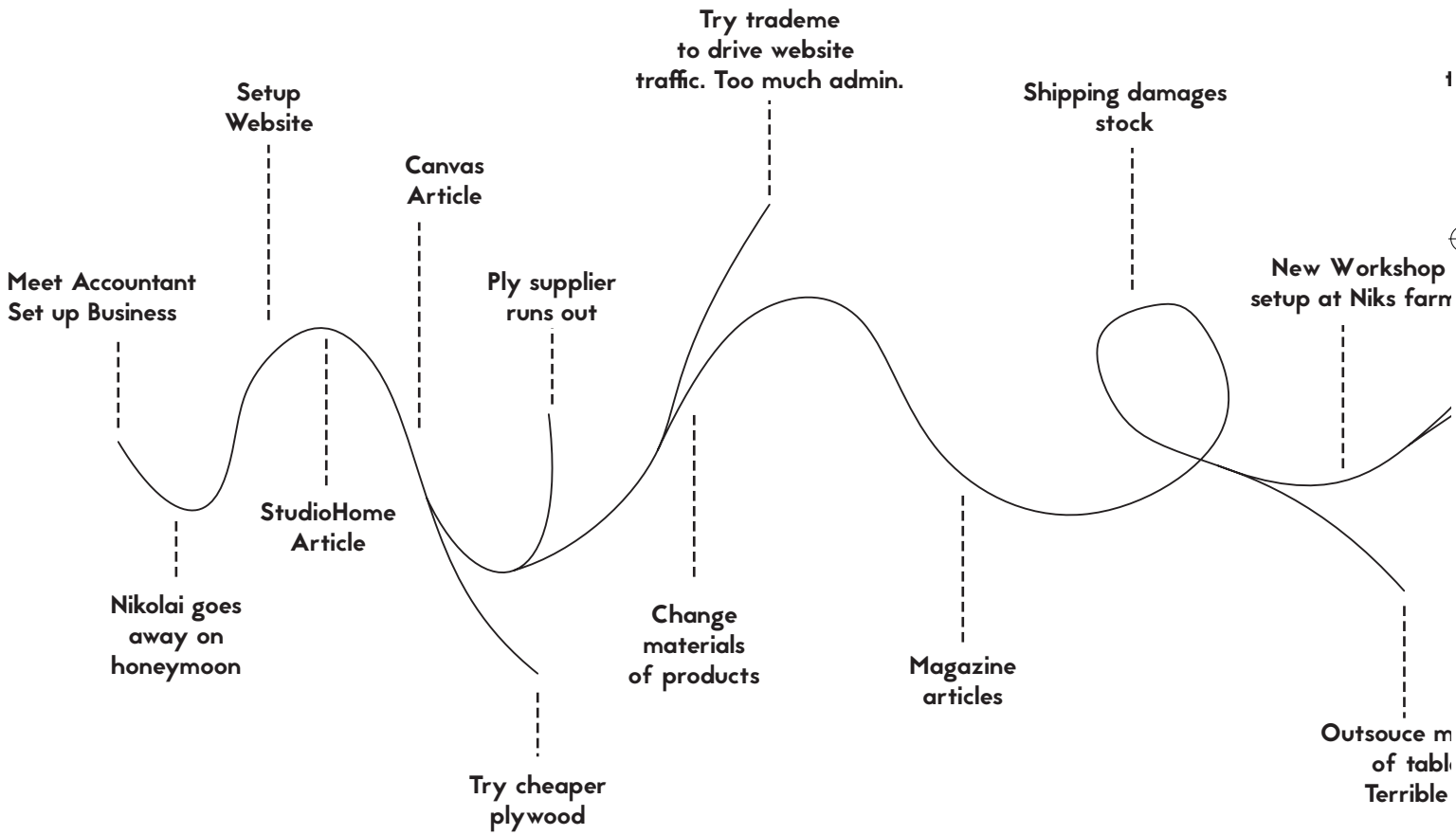
After getting our books back from the number crunchers, we were pleasantly surprised. This confusion gave us a heads up. We really needed some time with the accountant learning how to watch our profit/loss reports.

We had not touched the profits to pay ourselves a dividend, only rewarding Nikolai's labour with a per unit payment, meaning there was surplus there to hire someone to help us create the furniture. Yet we decided that, without an increase in our selling price and turnover, we could not sustainably employ someone to help us continue.

We continue to look at outsourcing and potentially importing some materials. This is a current hurdle and it could have been avoided had we factored the design/prototyping/labour component better into our prices. On reflection, this problem really stems from an attitude of "she'll be right," where our lack of critical business thinking has created some avoidable hurdles down the road. I expand on these in the following critical review.

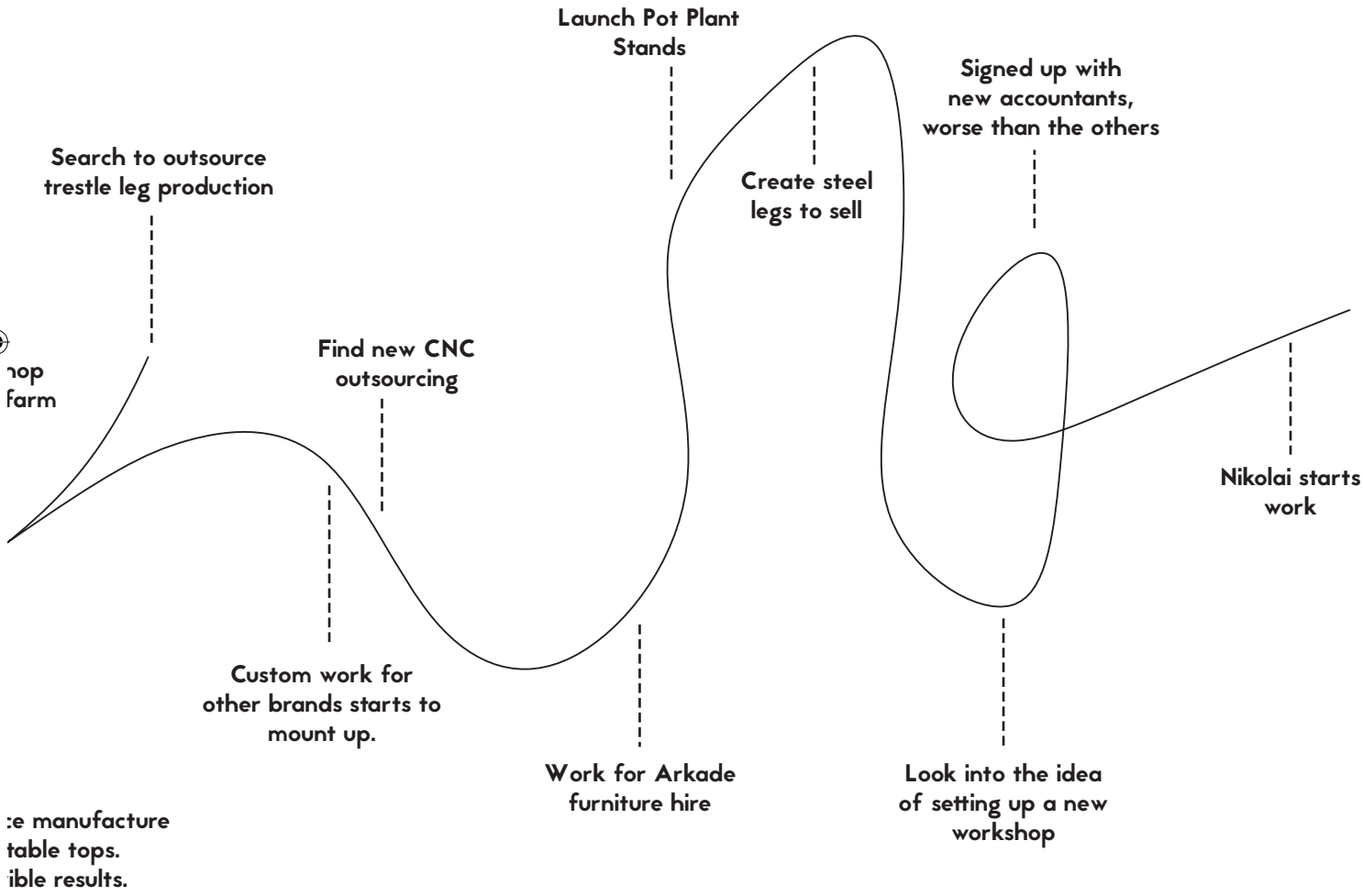


Above: My initial idea of business
Below: The path we took in business



oducts ---------- Design more products ---------- Sell more products

2014 2015



hop
farm

ce manufacture
table tops.
ible results.

xv. Critical Review

Participating in the creation and running of Trestle Union has given me a greater understanding of how product designer-makers or design entrepreneurs can participate in an innovation ecosystem. Experiencing the implementation process first-hand while running through multiple products gave us the opportunity to reflect on the strategies chosen.

Due to our non-existent business training and experience, most of our decisions in terms of business strategy were made from the limited knowledge we had gained through observation to suit our situation. The defining factors of these decisions were largely related to our immediate circumstances and short term vision to create some furniture and address the current opportunity: a product we could make ourselves easily, so we did not have to take the risk of investing in the production of stock without testing the market; lower cost, to reach a demographic of young professionals we were familiar with, a price we would be happy paying; flat packed, so we could operate purely online, allowing better storage and the ability to courier the product easily; clean lines and quality materials to help build a brand that we are proud of.

This short-term vision seemed far more achievable when future strategies to outsource production, if needed, were not thoroughly researched: those considerations seemed to drain the excitement from the task at hand. Looking back is always a luxury, but the lack of scalability for our design decisions became very evident when labour and admin began to take up most of our time. If someone had asked us if we could scale up production early on, I probably would have said yes without understanding the true cost of doing so. Our lack of understanding did not stop us from starting, as the desire to pursue the opportunity was stronger than our fear of uncertainty. Embracing uncertainty is something entrepreneurial activities require (McMullen & Shepherd, 2006). The scalability factor became very obvious and the designs we began working on from then on were outsourced immediately to free-up time. This approach was learning by doing and then designing accordingly. The importance of working in this manner for us was a way to get started, we needed to jump in. For most this would seem a very unwise decision to make: I knew very little about running a business, an aspect that may be true for many design graduates. There were opportunities to engage with business and commercialization experts, yet the idea of doing so was low on the priority list for a number of reasons. It seemed our innovation ecosystem contained people who had advice we could have learned from yet, without realising it at the time, I decided that they could be more hindrance than help. Unpacking the reasons behind why I chose not to contact these professionals is personal but hugely beneficial to this study.

Throughout the first year of Trestle Union, only two meetings with business or commercialization

professionals were held, despite the opportunity given to approach them for advice. These invitations was discussed more than once between Nikolai and I, as we knew we could benefit from some professional advice. But one thing that held us back was an overarching feeling that they were not very receptive to two graduate designers taking on a business venture. During the meetings, I felt there was more critical judgement without practical advice and helpful steps to move forward. My personality does not warm to critical feedback: I am happy to accept it where necessary but avoid it, if it is not helpful. We all have issues, this is mine, and it can be a hindrance. Engaging with more sound critique might have saved me a lot of time, yet previous experience with critical feedback that lacked empathy saw an avoidance of feedback altogether. When going into a critique it is important to be clear about what you want to get out of it also, listening and taking feedback can save you time and money. If investment is involved you can be sure to expect a grilling by investors, being aware of this is the best part of preparation as they will try their best to find a hole in it somewhere. How we avoid or embrace challenges can play a large part in the pursuit of entrepreneurial activities. It would seem from this example that personality clashes can have an impact on how we decide to pursue these opportunities. Understanding my own strengths and weaknesses has been crucial to move forward with my own practice, and Trestle Union has taught me some valuable lessons. These lessons -- how I interact in a business sense and where my weaknesses are -- have become clearer through experience. This comes from the value of applying an action research methodology, where only through action is legitimate understanding possible (Huang, 2010). The greater understanding gained from taking a product from concept to market is far broader than imagined when starting the case study for Trestle Union. Reflecting on the design, business and personal learning from Trestle Union all came down to the ability to give it a go, and learn along the way. This explorative approach contrasted advice given for detailed business plans, careful planning and subsequent execution. It would be a luxury to have all the understanding we needed before entering the business environment, but the time taken to perfect my shortfalls both personally and in a business sense could mean I would never have taken the opportunity.

The strategies of Trestle Union relied on available opportunities and our understanding at the time. It seems decisions were often made on the run and derived from our diverse ambitions. To start out, we did not have a specific goal to become a company but were armed with a product we had designed, and used our current knowledge of a path to market. Our method of exploration used resources we had and opportunities we saw. This approach was like an entrepreneurial process of effectual reasoning, a form of rationality described by Sarasvathy

(2001). The opposite of the word "effectual" is "causal." In general, most MBA programs teach students causal or predictive reasoning in every functional area of business. Causal rationality begins with a predetermined goal and given set of means, then moves to determine the optimal path to achieve the given goal. Effectual reasoning does not begin with a specific goal, but with given means, and allows goals to develop over time from the varied imaginations and diverse aspirations of the founders and their social network. This is described best by Sarasvathy using the analogy of causal thinkers as great generals seeking to conquer fertile lands and effectual thinkers as explorers setting out on voyages into uncharted waters. The balance of these two at different times is what makes great entrepreneurs, but entrepreneurs prefer effectual reasoning over causal reasoning in the early stages of a new venture (Sarasvathy, 2001). This is true for the Trestle Union case study and highlights the experimental approach taken as an important part of the process for early entrepreneurial activities. Effectual reasoning is inherently creative and an understanding of these two rationalities would be especially important when helping product design graduates implement their products for the first time. The tension between these two rationalities is what Trestle Union ran into when trying to explain an approach that felt explorative yet needed to have defined results. I struggled to explain the importance of our unplanned approach to commercializing a product and, when asked "where is this all going," I would feel as though we needed to make up an end goal to be a real business; yet it felt too early for this. The goal was and is still changing as new developments occur with Nikolai accepting a full-time job, while I am coming to the end of this Master's study. The flexibility of this effectual reasoning has been key to our progression but ultimately will need to be paired with a more causal approach including details of market research to financial projection, to team, to business plan, to financing, to prototype, to market, to exit while understanding that surprises will pop up along the way. For Trestle Union the surprises were the fun part and from our perspective it seems like design graduates could potentially give up the pursuit of entrepreneurial activities if forced to conform to an overly causal approach early on as this is counter to entrepreneurial

Looking back at the Trestle Union journey, I have outlined in the attached booklet the key learning during our progression through the implementation process. Some of the key points mentioned include some generic advice while others are more specific to our circumstances and the opportunities we had at the time. These have been boiled down to a list of important suggestions to aid graduate product design students seeking to engage in entrepreneurial activities.

xvi: Collaboration

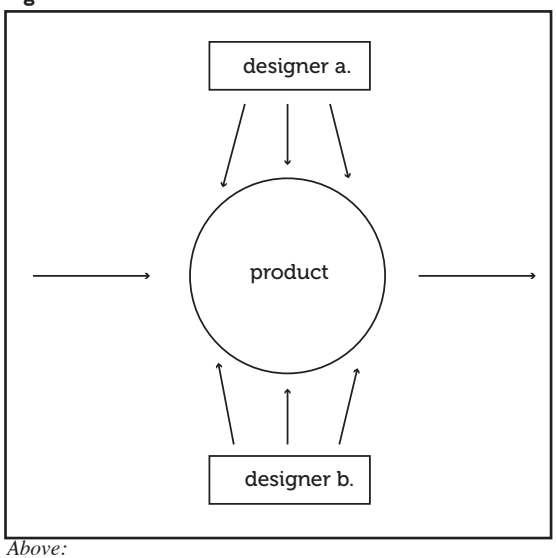
Considering some of the great designers I am inspired by I find it easy to think of them as a lone entity creating their work effortlessly, plucking ideas from the heavens, moving from chaos to clarity in a single bound. And this assumption is easy to hold onto when all we see is the finished product without the complexity of the process leading to its creation. It is much easier to explain a simplified development process of a product from the perspective of the designer than trying to build a concise picture of the tangled web of connections leading to its conception. Shenk (2014) draws a comparison with this simplified view of great individuals with Thomas Carlyl's statement in the 1840's "the history of the world is but the biography of great men." Shenk refers to this view as a lone-genius model and quickly offers the alternative view outlined by Herbert Spencer's retort to Carlyl where "the genius of the great man depends" on a "long series of complex influences". This view accepts a far wider network/culture of people involved in the process of creativity, or more specifically the design of objects. Accepting that the process of documenting all of these complex relationships is incredibly difficult I feel it is still important to recognise the larger network of collaboration during the Case Study of Trestle Union.

Holding the definition of collaboration where individual entities give up a degree of independence in an effort to realize a shared goal, I firstly collaborated with Nikolai Sorensen to form Trestle Union. Together we then collaborated with others in order to grow. Some of these connections we approached and others came to us as we became more visible.

During the Trestle Union case study I found the nature of collaboration to change dependant on the tasks we needed to perform, including; design, administration, labour, sales and marketing. Largely this difference was between collaborative design work and the other facets of business. I found that the intensity of collaboratively designing together was far greater than the administration or labour tasks involved in running the business. Overall collaboration in design can be seen as a far more difficult task than other aspects of collaborative work (Kvan, 2000). During collaborative design sessions, we would begin by prototyping a wide variety of designs individually, then come together to critique the models and slowly narrow down 2 or 3 options we wanted to pursue as prototypes. Finding design direction and solving problems together is a stretching process requiring constant verbal feedback in order to understand each other's moves, the reasoning behind them and the intentions. Kvan (2000) describes two models of design collaboration. Firstly (fig.5) a 'close-coupled' process where designers work intensely together to realise the design, usually where an observer could not identify a distinct contribution from one participant or the other. Secondly (fig.6) a 'loose-coupled' model where participants contribute what

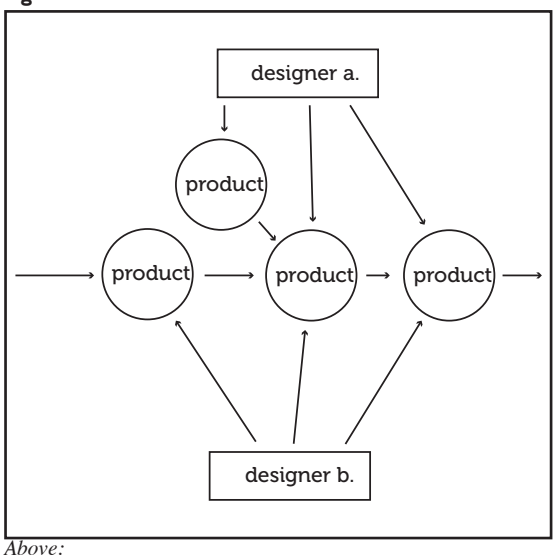
they can from their different domains of expertise. We found the process to be more aligned with the 'loose-coupled' as each of us would draw from previous experience, inspiration and problem solving abilities, often diverse but complimentary in design.

Fig 5.



Above:
Kvan's (2000) close-coupled process

Fig 6.



Above:
Kvan's (2000) loose-coupled process

One aspect that plays a significant role in the collaborative process is personality. Being aware of our personal traits and how these can work together is important when addressing design problems and understanding how we need to communicate in order to be heard or when to stop and listen to the other designer. Starting out I tended to revert to rapidly moving through the design process without verbally communicating to Nikolai what I was thinking through, I quickly discovered the benefit of talking through this process in order to clarify how I arrived at design decisions. Having an introverted nature I find it easy to run through thoughts quickly however this can be a barrier to collaborative work if the other participant feels shut out.

These periods of intense design were a luxury as we would often have to fit in discussions between classes, work, deliveries, via email, phone calls and txt. Often I would sketch ideas quickly as we drove out to a supplier in order to communicate visual concepts of prototypes. Our collaborative design process was not a neatly organised event held over two days with post-it notes of different colours and beautifully rendered product concepts, it was on the run, after hours, during sanding, surfing, we would pick it up and put it down when needed and report back to one another our 'thoughts on the go.'

Collaboration expanded beyond both Nikolai and I, so we began to see Trestle Union as being made up of suppliers, manufacturers, accountants, distribution, wholesalers and media. These methods of collaboration were equally as important to collaborative design yet were seen as being a defined collaborative relationship where set tasks were agreed upon and autonomously completed. Different to these autonomous relationships were opportunities to collaborate with other designers and brands, these were accepted and became an enjoyable yet sometimes stressful addition to our workload. Managing manufacturing times and deadlines can be a tricky task when starting to outsource production, because if one carriage de-rails you can soon end up with train wreck of weeks of work without anything to show for it. We avoided major train wrecks but learnt some great lessons of always having a plan B and C. We found that collaborating with other creatives there can be a lack of specific details as both parties were usually eager to get started on the project. These specific details do need to include discussions about Intellectual Property, as this can quickly become and issue if plans change for some unforeseen reason.

xvii. Key Insights from the Trestle Union Case Study

Core Values

Product designers' core values should be recognised when attempting to implement a design

Strengths

Product designers' natural abilities and strengths should be recognised and used when starting out

Relationship

Building relationships with other designers/ bloggers/media and customers is key for ongoing opportunities

Low Risk

Start with what you have and use what you've got: minimal investment is a good way to start

Time

Don't burn out: it is easy to spend large amounts of time and over-commit.

Collaborate

Designing with others enables more opportunities and diverse design outcomes

4. expert & graduate interviews

How can product design graduates make better use of innovative products designed during their study? Could these be a vehicle to become more entrepreneurial and drive innovation in New Zealand? What barriers and opportunities stand in their way?

xviii. Intro

Keenan Cummings, a leading New York City designer, remembers the sense of boundless optimism he had upon when graduating with his design degree; he "believed that design could induce change, that it could shape the way we understand and interact with our world." Apple founder Steve Jobs went further:

> "When you grow up, you tend to get told that the world is the way it is, and you [just live your life] inside the world, try not to bash into the walls too much, try to have a nice family life, have fun, save a little money. That's a very limited life. Life can be much broader, once you discover one simple fact, and that is everything around you that you call life was made up by people that were no smarter than you. And you can change it, you can influence it, you can build your own things that other people can use. Once you learn that, you'll never be the same again."

This belief helps contribute to a definition of design championed by those who may refer to themselves as design entrepreneurs (Hoover & Heltzel, 2013). In this definition, the designer is involved in a greater capacity throughout idea generation and implementation, giving greater capacity for design thinking and design doing. Design doing is where the designers are forced to embrace uncertainty and take risks (Hoover & Heltzel, 2013) by looking ahead to unrealized opportunities through an open process of synthesis. This process is integral to the development of innovative products and is seen as a more intuitive approach, contrasting that used within a business incubator model that tends to rely on gathered information from the past being analysed to then inform decisions (R. Martin, 2009). Literature relating to designers and their personal reflections on the entrepreneurial pathway is limited, with helpful insights originating from the American context rather than the New Zealand one.

xix. Expert Interview structure

Method:

Following the literature review and case study, a series of interviews were undertaken to explore possible barriers and opportunities that may be common to New Zealand graduate product designers. A range of professional product designers were selected to participate in a semi-structured interview to be recorded and later transcribed for analysis.

Design:

The interviewees were invited to participate in the research by an email sent to an address obtained on a publically available website. On confirmation, the practitioner arranged a time that suited each interviewee to meet for a face-to-face conversation. Qualitative interviews are useful in terms of generating a broad understanding about a particular issue, problem or opportunity (Warren & Karner, 2010). They are sometimes called in-depth or intensive interviews and centre on the meanings that certain life experiences hold for the individuals being interviewed. In the context of this study, expertise provided may include personal experience of opportunities and/or barriers faced as a product design graduate, insight into design entrepreneurship, and the development of innovative products, including idea generation and idea implementation. Interviews give the researcher the ability to go to the "living source" (Platt, 2002), and go beyond mere outward behaviour and phenomena to secure accounts of events and processes as they are reflected in personal experiences and social attitudes (Warren & Karner, 2010), providing insight that cannot be obtained through other research methods (e.g. focus group interviews or questionnaires) (Reay, 2009).

Participants:

The 8 participants had all graduated from a New Zealand University and gone on to either successfully or unsuccessfully create products of note for themselves or a respected design professional. The first group of interviewees were identified as professionals in design who are recognized for their notable work and current activity in design, nationally and internationally, while establishing their own successful businesses. Their product design work bridges idea generation and idea implementation, where they are involved in the front-end and back-end of innovation. The second group of interviewees were graduate product designers identified using publicly available networks. They were just starting out. Participants were also selected through convenience sampling, a non-probability sampling technique, and these were conveniently accessible due to their proximity to the practitioner.

The combined knowledge of the participants in the area of New Zealand design brought further

understanding of the issues faced by entrepreneurial design graduates. The sharing of ideas and open communication between experts and practitioners contribute to the strengthening of the New Zealand design community, especially those considering it as a viable career pathway.

Procedure:

Before the interview process, approval to carry out the study was sought and obtained from the AUT Ethics Committee (AUTEC Reference Number 14/250).

Participants were contacted directly via information found in the public domain. A single email was sent inviting potential participants to participate in the research and this included a letter and information about the interview process. If no response was received, this was taken as the participant declining the interview. The face-to-face interview was conducted in the workplaces of the interviewee, or another suitable public location agreed by both parties, for no longer than an hour. With the permission of the participant the interview was audio recorded and later sent to a transcriber. The text generated was further analysed using a qualitative thematic analysis method, whereby the practitioner read through the transcribed text many times to code and identify common and divergent insights gained from the participants. These insights aided in generating a greater understanding of the issues and a range of perspectives and possible strategies for working with product design graduates seeking to implement their designs.

The key perspectives were then developed further to conceptualize a framework for future development and initiatives. The participants will remain anonymous during the research, being referred to as participants only.

A series of open questions were used to direct conversation towards the interview topic. Additional questions were added as the interviews progressed to explore peripheral issues and insights that the practitioner became aware of during the interview.

xx. Question themes for the interview:

Background

How would you describe your journey from graduating to working on non-client based design work?

Defining Entrepreneurism

What is your understanding of the term entrepreneur, and how do you view yourself in this?

Do you consider yourself a designer and entrepreneur?

Do you think entrepreneurship can be taught to designers?

Opportunities

What opportunities have helped you propel your design career?

Challenges

What challenges have you faced since starting out on your own?

Data Analysis:

All transcripts (textual data) were thematically analysed using the qualitative data analysis tool TAMS Analyzer. The data was read multiple times to code it into emerging themes. Codes were added while reading and then later grouped into themes to highlight the common and divergent themes present in the data.

Results:

Participants offered their perspectives on entrepreneurial designers and the opportunities and barriers faced during their early career following graduation from Art and Design programmes in New Zealand. The themes from the interviewees are presented as quotes to highlight insights as appropriate.

Discussion Plan:

The Discussion focuses on the opportunities highlighted by the graduates as contributing positively to their professional development. The discussion then outlines the barriers faced by the graduates and their opinions on the effects these had on their developing role as a professional designer. This also captures their perspectives on the development of opportunities and initiatives for future product design graduates in New Zealand.

Current New Zealand product design graduate perspectives were included to compare data from both emerging and established talent. To analyse the perspectives of emerging New Zealand product designers seeking to further their career in product design, I recorded their journey to date during an interview. Following the same format as the expert interviews, the audio recordings were later transcribed into textual data for thematic analysis using the same qualitative data analysis tool TAMS Analyzer. These perspectives were analysed, along with the barriers and opportunities each faced and the approach they took to move forward in their chosen career.

xxi. Interviews

Perspectives on Entrepreneurism from Design Entrepreneurs

As noted earlier in this exegesis, there is no universally accepted definition for "design entrepreneur," and this prompted the questioning of New Zealand product design professionals as to the validity of the term for New Zealand product design graduates. Unsurprisingly, a general consensus was not achieved on the term's definition, but the varied reactions and responses to questions revealed that they generally had a greater understanding of the term "entrepreneur:"

"I guess I'd like to think I have some sort of entrepreneurial spirit with starting my own business and giving that a crack."

"I'm pretty happy-go-lucky, I wouldn't consider myself to be entrepreneurial, perhaps culturally entrepreneurial but not business minded, I'm a shit businessman."

Participants spoke of their entrepreneurial style. While one participant did not consider himself entrepreneurial, most articulated a specific style of entrepreneurism related to their current role. A younger professional did not align with a specific style but recognized their "entrepreneurial spirit" in the action of starting their own business. Another participant suggested this "drive" cannot be taught through education but can be initiated in an educational environment:

"I don't think it can be taught, I think it's kind of something you have that drive or you don't have that drive. I think in people that drive can be initiated through an environment like this (university)."

Another participant rejected the term "entrepreneur," expressing frustration due to the vague definition of the term.

"What is an entrepreneur, I think it's a word that could describe anything right, there's design entrepreneur, creative entrepreneur, I reckon it's rubbish, I don't like that label at all. I can't even tell you why I don't like it."

Opportunities

Response from participants concerning opportunities and barriers in their professional development following graduation revealed numerous successful opportunities and very few specific barriers. They seemed forward focused, seeing barriers as learning opportunities to find creative solutions. It was noted that predominantly proactive approaches were taken, instead of reactive ones. All suggested an alignment to their passion was needed to pursue a vision of how they wanted to see themselves as designers.

"I was presented with an opportunity that I got stuck into and love. I didn't sit down and think where's there a hole in the market that I could create something to fill."

A theme emerged around their having a clear vision or passion for their desired role as a designer, that encouraged them to pursue opportunities:

"It was in my third year there that they have a part of the course there that is called a practicum where you go out and work for three weeks unpaid for someone of your choice. That's when I really discovered furniture design and how it could work locally with designing your own product and outsource and manufacture. I felt I was doing so much more out working for him and it was more beneficial than being in at uni, so that was kind of my path to what we do now. I could have gone sideways and done something quite different, but I just had this idea of how I saw it working, so I decided to set up my own thing."

"Our skills I think are in being quite aware of what we're good at. I think this is very important as designers."

All participants spoke of the importance of collaboration during their formative years and the guidance of key people providing opportunities, encouraging growth, and in some cases giving direction. The following quotes give reference to these insights from participants.

"There's nothing better than to learn working under a maestro I guess to learn somebody's special ways of looking at things. It was cool and I absorbed kind of by osmosis and by proximity a lot of his approach to objects."

"I haven't done anything in isolation or in a vacuum, but been a sponge to other people's coaching, criticism, input and feedback."

"We definitely had cross-over where some of his clients loved some of the stuff I did, we did a few jobs together as a result of it, and I think sharing a studio space just kept us motivated to turn up at work at 8 o'clock in the morning rather than not. I think it was huge and that it was hugely beneficial that we shared that space, and it probably generated more work than we would have had with just being alone, and it made it enjoyable."

"There was always somebody there who was a real mentor in my life, and then there were other people in my life who, now looking back, I realize were in the background behind the scenes also helping along the way."

"I ended up working for my dad for about six months or so and I was lucky because he encouraged me to actually start doing this furniture thing."

Barriers

Themes concerning the barriers faced by the participants were fewer in number. Two of the participants related barriers to the difficulty in finding work specific to their area of design.

"It just seemed especially at that time that if you wanted a job you were going to have to go overseas.

I think it's still currently the case but there are other alternatives now as well."

"Returned back to NZ knowing exactly what I wanted to do but to be honest I couldn't find a job that provided that, or there weren't many jobs around what I wanted to do."

A personal reflection by one of the participants revealed insights into the consequences of missing opportunities during entrepreneurial collaboration:

"I regret not tuning in a little more to him, to his style and what he was good at, his strengths. He knew how to turn something into a profit, and he knew how to say no. These were all things that I failed to do."

This is an honest account of how the interviewee potentially could have avoided some of the pitfalls of working as an independent designer. Reflections like this are valuable in the sense that the admission of failings by practitioners allowed valuable insight into the strengths of successful designers.

Self-concept (Experts and Grads)

Throughout the interviews all participants spoke of the importance of finding their position within the product design field. Another theme discovered in these responses emerged from the participants' desire to connect their profession with their principles, values and deeper understanding of themselves:

"I think the trick is really just knowing yourself, knowing what you need to do."

"I'm sure someone could do a case study on my business and find it's got holes all through it, or that it could be way more profitable or make a lot more impact or whatever, far wider reaching, but it runs on my own principles which are things that only I understand and I wouldn't want to do anything else necessarily."

The graduate participants also highlighted a desire to position themselves and recounted insights that aided the development of their own sense of who they are as a product designer in New Zealand.

"I went back into that 5th year of postgraduate study... And not to be too cheesy I felt like I'd found myself a little bit better and it made more sense. So I focused on exploring the craft as well as the deeper meanings of perhaps design and where design can go for me."

"... when I was studying I was confused about what I wanted to do and I'm still trying to work that out... it's turning out to be a kind of hybrid thing where I'm here doing design but I get really excited about making work for other people and making opportunities for other people. I find that's not just really design at all I don't know what it is but I enjoy being part of that."

These insights into the earlier stages of personal development help the practitioner to formulate a clearer picture of the importance both graduates and professional product designers place on the awareness of personal strengths and weaknesses. This importance relates to the underlying idea that

staying true to the designer's self-concept is crucial to become a successful designer.

"Our skills I think are in being quite aware of what we're good at. I think this is very important as designers. It can be dangerous to have a model of a designer that you think is what you'd eventually aspire to, eventually you are not good at being that person."

One participant went to considerable effort to explain the dangers of advocating particular models of designers within the profession:

"I don't think you can tell a man how to behave to be a successful designer, whether they want to be on their own or work for someone else... at the time schools would all kind of teach that approach, that you should be a designer-maker and that you should be making your own product and doing everything that comes with that, and it seemed to me really dangerous and it still does.... I think that everyone was just getting lost in the cycle of making stuff and forgetting about the fact that universities should be about grounding you in a thought process and in an approach."

This critique does not portray the designer-maker opportunity as wrong but highlights the important role universities have to play in design education. This aligns with another participant's view that "more established people were successful as designer-makers."

Recent Graduates

Participants who were recent graduates recounted in greater detail the barriers faced when implementing a design, such as overheads and costs attributed to prototyping:

"I realized the massive barriers to being able to work freelance within product design because the overheads for things like prototyping are often not what people want to pay for. They just want an idea and they want you to do the drawings and give it to them."

Another participant gave an example of doing freelance work for a client and spoke of the excitement of starting a product design brief – only to have their expectations of greater freedom to research cut back by the client.

"I thought this is mean, this is a chicken coop, like a product! Not a lot of product design exists for freelancers, so we just got stuck in. I remember over summer and the end of 2012 doing what we thought was a pretty tight brief, doing some research and some making and testing, a couple of meetings... copy things other people seem to be doing as far as working through a process for a client... and I remember them coming back with thank you for this and then an edited version of it saying this research will not be necessary and stripping it back to 40 hours..... we thought that was pretty slim."

Graduates spoke of their search for a greater sense

of direction during study, and also the discovery of this greater sense of direction through internships, and their early roles as product designers.

"It felt like at the start it was very tricky to see where I was heading with it, but throughout this year I've started to see the various aspects as it's built together it seems like something I'm pretty well suited to and it's a good balance between making and testing and there's a lot of graphic design stuff which I'm really interested in."

Participants reviewed the development of their self-concept, and revealed what their opportunities had been. One stated:

So that was really valuable when I did that internship because it made me much more aware of the value of some of the stuff I had and areas I lacked in, and also shaped up where I didn't want to go and where I did want to go as well. It made it much more clear for me.

The more-established product design graduates had a clearer idea of where they saw themselves working within the industry, coming to the conclusion that they would start their own business. This aligns with previous observations.

"Because there were no real jobs out there that I was interested in and I was really aware of not stepping into a job that would put me in a similar situation to what I was in, but in the design industry, working for the weekend and stuck in an office thinking is it 5 o'clock yet. So because there was nothing out there and there are very few jobs that are probably like that, I thought well I will create my own one."

One participant in particular demonstrated awareness of this process of development and spoke of the tension they felt between design roles they were aware of even during study:

"I feel like I'm kind of in an area that is a good balance between some of my tension in study as well, I'm not sure if I really want to go in for CADing (Computer Aided Designing) all day or I'm not sure if the design studio is quite my fit so it feels like a good balance at the moment, kind of a variety of things."

This shows the evolutionary nature of participants' concept of what kind of designer they were and where they fit in the industry.

xxii. Discussion of Interviews

All participants had worked as self-employed product designers at some stage since graduating, giving them the ability to articulate barriers and opportunities encountered after graduation and when seeking to implement their designs. They were first questioned on their understanding of entrepreneurism and the term "design entrepreneur." This question highlighted a doubt on the part of the practitioner about the validity of the term and its application to graduate designers seeking to implement their innovations. Unsurprisingly, participants gave varied definitions but they did connect the term "entrepreneurial" to business expertise, and also an inner drive to give their ideas a "crack" through implementation or commercialization. The practitioner feels the suitability of applying "design entrepreneur" to product designers who implement or commercialize their designs requires further research, which is outside the scope of this study. While acknowledging that they exhibited similar traits to entrepreneurs, the participants' focus was first and foremost on product design.

A dominant theme that emerged from the participants' personal reflections of barriers and opportunities faced since graduating was the challenge of finding a role within the product design industry that best suited them. The approach (proactive or reactive) taken by participants to opportunities was influenced more by participants' character and personality than nature of the opportunities available.

All participants spoke of early opportunities aiding their conception of where they saw their career heading by exposing them to what they liked or didn't like. These included internships and early roles as product designers or working in the retail environment of design stores. Participants also spoke of how these early roles created connections for them to further explore where they could establish themselves as product designers in relation to their self-concept. This theme of self-concept development aligns with a previous interview given by the practitioner. The following statement emerged as part of the reason for not continuing with a seemingly successful product design, revealing the importance of personal values when making design decisions.

"If I were to produce them they would be in a very high-end area of the surfboard market... I would only sell to those who could afford them, meaning there would be considerably less impact for the needed change within the surfboard industry, I would rather make something my friends could buy."

The values held by the designer help guide the decisions made in both examples, suggesting that identities rely less on institutionally "ascribed status or place" than on the spaces that we make as actors in the social world (Campbell, Schwier, & Kenny, 2005). Campbell et al. make a case for design practice as ethical knowledge in action: "agency emerges from the designer's validated sense of identity in institutions of higher learning."

Participants' responses suggest the validation of a sense of identity or self-concept as key to determining whether or not a product designer will choose to embrace the opportunity and equally the risk and uncertainty of pursuing the implementation or commercialization of their products. That validation process extends past institutions of higher learning and may be aided by internships and early job opportunities.

Rather than a lack of opportunities and multiple barriers stopping product design graduates from pursuing the implementation and commercialization of their products, participants' responses suggest this relates more to an individual's core values, principles, and sense of drive. Where practice is embodied in the designer's core values and beliefs (Herda, 1999).

Herda's (1999) suggestion that practice is embodied in the designer's core values and beliefs links with participants' views that the entrepreneurial drive found in some designers cannot be taught; it can but be initiated through experience. This highlights the importance of designers engaging in exploratory activities during or soon after their education to develop a better sense of their self-concept. This in turn creates the "spaces" (Campbell et al., 2005) speak of that we make as actors in the social world, and helps define designers' "position" (Jackson, 2012) in the ecology of actors contributing to innovation.

Insights

Deciding to explore the unfamiliar area of commercially implementing a product I had designed enabled close observation of small business practice for two emerging designers; myself the practitioner and also a product design undergraduate. This emerged in the form of a case study. The barriers and opportunities encountered during this case study enabled reflection on the process of implementation. Key reflections made during this case study helped guide the questioning and discussion held during the expert and graduate interviews. Similarly the feedback given by the expert and graduate participants fed back into the case study as reflections were made of the insights given.

These key insights are further developed into key points to aid graduate designer-makers as they start out.

xxiii. Key Insights:

Core Values

Core values of designers are key to their direction in Product Design careers in New Zealand.

Opportunities

Opportunities are important for product design graduates to explore where they would likely fit within the product design profession.

Barriers

Product design professionals see barriers as learning opportunities where creative solutions can be found.

5. discussion

Drawing from the insights gathered during this practice-led research I began to compare both the expert and graduate interviews along with the insights from the Trestle Union case study. Interviewing New Zealand product designers about the journey to their current position within the product design field impressed the value of my own journey and previous research.

Commonalities soon became evident, in particular the emphasis on the role of the designers' personal values guiding their chosen career-path and product development opportunities. The exploration of these opportunities in both the interviews and case study noted the proactive approaches taken by designers to search out product development or job opportunities through whatever means and using whatever resources were available to them at the time. Generally this relied on established relationships, collaboration and firm understanding of their strengths and, guiding ideals and principles.

A principle can be seen as a rule or belief governing one's behaviour (Oxford 2015), and an ideal is a principle or value that one pursues as a goal. I first recognised the interaction of my own ideals and product design work during a reflection following my Cleaner Waves research project, and again while creating the Trestle Union case study. An ideal both Nikolai and I hold is the importance of making design accessible for many by providing furniture that embraces the tension of product quality without purely focusing on economic returns, to provide quality furniture at a better price for more people. Guiding principles were also mentioned by the interviewed designers when speaking about their own practice..."it runs on my own principles which are things that only I understand and I wouldn't want to do anything else necessarily."

It seems these principles exist for both individuals and communities. In the past artists, designers and collectives have created manifestos that are declarations of their principles, intentions, motives, or views. Of those the Staatliches Bauhaus are notable with the manifesto created by architect-director

Walter Gropius in 1919, where Gropius announced the Bauhaus aim of architecture, sculpture and painting were to lead back to the crafts. More recently designer Hella Jongerius and theorist Louise Schouwenberg launched their manifesto, titled Beyond the New: a search for ideals in design. Jongerius and Schouwenberg reference the Bauhaus while stating that "we [designers] have lost sight of the higher ideals that were so central to the most influential movement by far in industrial design." These ideals included "making the highest possible quality accessible to many people." As I have found with Trestle Union, these ideals are powerful as a guide to motivate us to imagine a different future, but the reality of which provides the challenge to work toward the chosen ideals using what we have available to us at the time. In the case of Trestle Union, a large part of what we had available to us came from initial workshop resources at AUT and also drawing on our established relationships with peers, others designers, mentors, friends and family. Beginning to pursue my ideals and principles through the opportunity of Trestle Union, I became more aware of the larger innovation ecosystem, and my role within it. As I am a student undertaking research and also taking part in a business designing and manufacturing furniture, I sat between the previously described knowledge economy and the commercial economy.

Towards the end of my Master's, this became an increasingly difficult position. I needed to focus on both simultaneously rather than work through the cyclic nature of research and commercialization neatly described in Fig.2. The nature of running a business as part of a larger body of research did add a deeper layer of meaning to the activities of Trestle Union, yet the complexity of doing both while working full time was very demanding. The immediate help from friends and family and also reaching out to other designers, media and mentors, followed by the later connections made through Trestle Union, provided much needed support; yet the drive to continue both the research and the business of Trestle Union was something that

seemed to come naturally at times; at other times I needed to cultivate this drive. What seemed an easy way of cultivating the drive was saying yes to new opportunities; this provided a sense of excitement, yet added to the growing number of tasks, so what seemed a strength was weakness I needed to learn from. Learning the importance of choosing which opportunities to take and which ones to leave became a valuable learning experience and the learning from doing was the true value of Trestle Union. Although both Nikolai and I commercialized a simple range of furniture, the process through which we did this was equally as important as the strategic decisions we made throughout the case study. These decisions were often based on our principles/ ideals, providing the majority of drive to engage in entrepreneurial activities. Even though I will outline opportunities for graduate product designer-makers to implement their work, there needs to be a deeper understanding of the principles/ideals for why they want to do this. As captured during the interviews, an individual's principles/ideals are often personal and only they will understand them. We each have a unique set of abilities, expertise and social connections, these are the means entrepreneurial activities rely on when starting out. This rationale is outlined by Sarasvathy's (2010) effectual reasoning, explaining that all entrepreneurs begin with three categories of means: (1) Who they are, their traits, tastes and abilities; (2) What they know, their education, training, expertise and experience, and (3) Whom they know, their social and professional networks. Most often, they start small with the means closest at hand then move directly into action without elaborate planning. In contrast to this is causal thinking of sequential progression through a complex arrangement of market research, financial projections, team relationships, business plan, financing, prototyping, to market, to exit etc. If the natural inclination of design graduates seeking entrepreneurial activities is towards effectual reasoning, then prescribing detailed causal thinking strategies early on for design graduates exploring entrepreneurial activities may squash their desire to implement their designs. Another important aspect to effectual thinking is the low cost involved in starting out, as Sarasvathy (2010) highlights the fact that this rationale may not increase the probability of success for entrepreneurial activities but it reduces the costs of failure by enabling the failure to occur earlier and at lower levels of investment.

6. conclusion

New Zealand Product design graduates seeking entrepreneurial activities should start small using available means to explore immediate opportunities.

xxiv. Conclusion

Using a design led approach I set out to create a business in order to explore what barriers, challenges and opportunities new product design graduates might encounter when undertaking an entrepreneurial approach to their studies. Also exploring how design with an entrepreneurial goal influences the design process.

Objectives included:

- Follow a furniture design project from concept design to market implementation, documenting the barriers and opportunities experienced.
- Collaborate with another designer maker to provide an additional perspective of the journey and to explore how the collaborative process may influence the design process or entrepreneurial outcomes.
- Research opportunities for designer makers to prototype and create limited runs of product after they graduate.
- Interview 8 New Zealand product designers about their opportunities and barriers faced after graduating and any entrepreneurial projects undertaken.

Findings from these objectives noted that product designer-maker graduates looking to engage in entrepreneurial activities with products they design would do well to develop a greater awareness of themselves and may also benefit from needed support during their journey.

As shown in the Trestle Union case study, our trial and error approach and ability to dive into the process of implementation allowed both designers

to explore their core values in relation to their design practice. This case also allowed us to experience first hand what graduate product designers may face when trying to implement their designs, providing a greater understanding of what resources would have helped this journey.

The detailed steps of how Nikolai Sorensen and I went about this give an insight into chosen methods and thinking behind the decisions made during the design of this small business.

Key insights found during the Trestle Union case study included:

-Establishing core values held as designers.

-Recognizing personal strengths .

-Low risk when starting out.

-Time management for work/life balance.

-Learning through collaboration.

Both the expert interviews and case study suggest that recent graduates who develop a greater awareness of their self-identity could apply this understanding of themselves when assessing opportunities guided by their ideals and principles, giving deeper meaning as they pursue the implementation of their products. As found in the case study the complex path of implementing a product requires a deeper sense of meaning in order to tackle barriers and maintain the passion and drive required to implement the product. Interviewing experts also revealed the importance of understanding personal core values in order to better discern opportunities for product implementation. Key insights found during the expert interviews included:

-Establishing understanding of core values.

-Pursuing opportunities in order to better understand their own strengths and weaknesses.

-Identifying barriers as learning opportunities.

Sarasvathy (2010) suggests that entrepreneurs learn through action and the process of taking a product to market gives valuable learning and confidence to repeat this process.

This process of starting a business was important for myself as a designer but at times became unmanagable in combination with a research project.

For product design graduates who would like to see their concepts become a reality, I suggest a test space where they could begin to go through the process to implement their product concepts. This would add to available means and encourage them to start small and explore available opportunities. By engaging in idea generation all the way through to product implementation, they gain an idea of what the implementation process is like but equally what drives them to develop the product. This begins to outline to them who they are as product designers and what ideals/principles they are driven

by. These insights help contribute to the means by which entrepreneurial activities can be pursued. This early engagement with product design graduates may not increase the success of entrepreneurial activities, but instead reduce the costs of failure by enabling the failure to occur earlier with lower levels of investment.

The following page summarises 7 key points for product design graduates to be aware of when they begin looking for entrepreneurial opportunities with their own designs.

1. Try something!

2. Be aware of what you are good at, develop a better sense of self, core values, beliefs and abilities.

3. Building relationships with other designers/bloggers/media and customers is key for ongoing opportunities.

4. Start out low risk and low cost.

5. Have a good sense of vision of where you want to go, this will eventually be your business plan.

6. Barriers/surprises/failures should be seen as design opportunities.

7. Take a break occasionally, do not burn out!

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