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Four Mindsets of Designer-Entrepreneurs

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ABSTRACT Literature from the business and design disciplines describes two important subprocesses of the entrepreneurial journey: new venture creation and new product development. This study uses evidence from qualitative research with Designer-entrepreneurs (D-entrepreneurs) to describe a third important subprocess, which we refer to as the Designer's Mindset Transition (DMT), which can either hinder or propel the other subprocesses. Thirty-seven participants, including eleven D-entrepreneurs in product-based start-ups, participated in the study. Four designer-entrepreneurs' mindsets were identified within the DMT subprocess: The Artisan, the Configurator, the

Opportunity Seeker, and the Design Leader. They followed a progression that moves the Designer-entrepreneur from the effectual logic (means-oriented) towards a causal logic (goal-oriented). Evidence from the study demonstrates that designers starting from the Artisan mindset were not always driven by their purported user-centric approach. Instead, key drivers were their priorities, interests, and beliefs, established at the outset of the venture.

Keywords: Designer-entrepreneur, designer-entrepreneurs' mindsets, entrepreneurship, design ventures, product-based start-up

Introduction

 Over the last decade, there has been an emerging trend of designers becoming entrepreneurs (Gaglione and Gaziulusoy 2019; Colombo, Cautela, and Rampino 2017; Mata-García, Deserti, and Teixeira 2017). Designers can hone skills and competencies such as user need identification, idea generation, conceptualization, and product development that prepare them to be natural entrepreneurs (Günes 2012). In this study, Designer-entrepreneurs (D-entrepreneurs) took an idea forward, built a product and started a business based on it.

The body of knowledge relating to this sort of designer-led entrepreneurship has been slowly but steadily increasing, in the form of handbooks (Varon and Alberti 2019; Talarico and Heller 2016; Basadur and Goldsby 2016), tools (Colombo, Cautela, and Rampino 2017), typologies (Chen, Chang, and Pan 2018; Valencia et al. 2018), case studies (Kremel and Wetter-Edman 2019; Valencia and Pearce 2019; Val et al. 2019; Gaglione and Gaziulusoy 2019; Liu and Rieple 2019; Mata-García, Deserti, and Teixeira 2017; Møller-Nielsen et al. 2013) and models (Müller and Thoring 2012).

The Business School discourse on the entrepreneurial journey of product-based start-ups attends to two key subprocesses, New Product Development (NPD) and New Venture Creation (NVC). A range of methodologies can drive each subprocess forward. For NPD around tangible products, relevant and notable methodologies include the Design Council framework for innovation (Design Council 2019), the Nesta innovation spiral (Nesta 2019), Google design sprints (Knapp, Zeratsky, and Kowitz 2016), human-centred design (IDEO 2009), and Design Thinking (Brown 2008). Whereas for NVC, key methodologies include the Start-up Evolution Curve (Jonikas 2017), Nail-it then Scale-it (Furr and Ahlstrom 2015) and the Lean Startup (Ries 2011). To blend these two subprocesses of the entrepreneurial journey, Frog Design (2016) created the Design Ventures methodology, integrating design thinking and NVC. Müller and Thoring (2012) theoretically suggested a blend of design thinking and Lean Startup — Lean Design Thinking — to draw from the

advantages of design thinking during the ideation and building stage and the importance of quantitative methods and rigour of the Lean Startup.

Although these are well-recognized approaches, these models do not address the entrepreneur's disciplinary background (and therefore, any intrinsic priorities, interests, and beliefs), assuming that by following them, designers, engineers, or businesspeople would have comparable results.

This paper presents evidence from an investigation of the entrepreneurial journeys of designers launching product-based start-ups (hereinafter referred to as D-entrepreneurs). It presents a third important subprocess of the entrepreneurial journey, which we refer to as the Designer's Mindset Transition (DMT). DMT considers the necessary changes in the D-entrepreneurs' priorities, interests, and beliefs at various stages of their entrepreneurial journey.

Research question

How do designers transform themselves into entrepreneurs in product-based start-ups?

Study aims and objectives

The study aimed to understand how designers transform themselves into entrepreneurs in product-based start-ups. The main objectives were: i) to understand the entrepreneurial journey of designers leading product-based start-ups, ii) to identify milestones in the course of that journey, iii) to understand the designers' priorities, interests, and beliefs that may hinder or propel the entrepreneurial journey, and iv) to explain how and why designers may change their priorities, interests, and beliefs at different stages of the entrepreneurial journey.

Literature review

Understanding design entrepreneurship

Ries (2011) described entrepreneurship as a kind of management, referring to the set of activities, administration of resources and planning to achieve the start-up goals. Kaehler and Grundei (2019) gather almost 30 definitions of management. The prevailing concepts consist of coordinating, planning, decision-making, integrating, organizing, leading, and controlling people and resources to achieve a task or goal. Blank and Dorf (2012) defined a start-up as a temporary organization searching for a scalable, repeatable, and profitable business model. Jonikas (2017) added that a start-up engages in technology, new products or services, new production methods, new cost structures and pricing. Therefore, entrepreneurs must manage people and resources to innovate in technology, products, or services to achieve a scalable, repeatable, and profitable business.

Within the realm of design, entrepreneurship does not have a widely accepted definition. Günes (2012, 64) described design entrepreneurship as the 'discipline in charge of producing and marketing the intellectual properties of a viable concept in terms of assuming risk, financing, and managing'. Basadur and Goldsby (2016) described a framework of design-centred entrepreneurship that comprises problem-finding, fact-finding, idea-finding, evaluation and selection, planning, acceptance, and action. This resembled several steps referred to in the Design Council's framework for innovation (Design Council 2019). Ryan and Vaugh (2019) described design-driven entrepreneurship using business cases where entrepreneurs used the design approach as their main competitive advantage.

Typology of approaches involved in design entrepreneurship

Valencia et al. (2018) compiled the most relevant theories from design and entrepreneurship studies into a Design Entrepreneurship for Consumer Product Innovation (DECPI) typology to theoretically explain Design Entrepreneurship. The proposed typology combined the effectual and casual logic as proposed by Sarasvathy (2001), bricolage presented by Baker and Nelson (2005), strategic design as described by Calabretta, Gemser, and Karpen (2016) and design thinking as depicted by Brown (2008). An adaptation of the DECPI typology is shown in Figure 1.

The thinking of entrepreneurs

Entrepreneurial studies explained the logic used by experienced entrepreneurs, noting their predisposition to be hands-on and follow a hypothesis-driven approach (Fisher 2012). Sarasvathy (2001) coined the terms effectuation and causation to explain the logic of entrepreneurs. Expert entrepreneurs use effectual logic to make decisions based on what they have at hand, where they rely on their network, while their end goal is not fixed. They perceive challenges as opportunities (Sarasvathy 2008) - a characteristic also identified as part of a 'growth mindset' by H. Neck, C. Neck, and Murray (2018, 221). The entrepreneurs following a causal logic prioritized knowledge and prediction to minimize risk, whilst the entrepreneurs following effectual logic decided what they were willing to lose, rather than focussing only on the possible gains (Sarasvathy 2001). Designers and entrepreneurs share many traits, such as empathy (H. Neck, C. Neck, and Murray 2018), an explorative mindset (Møller-Nielsen et al. 2013; Günes 2012), resourcefulness and creativity (Frederick, ÓConnor, and Kuratko 2013), a hypothesis-driven approach and working with given means (Sarasvathy 2008) and bricolage (Baker and Nelson 2005).

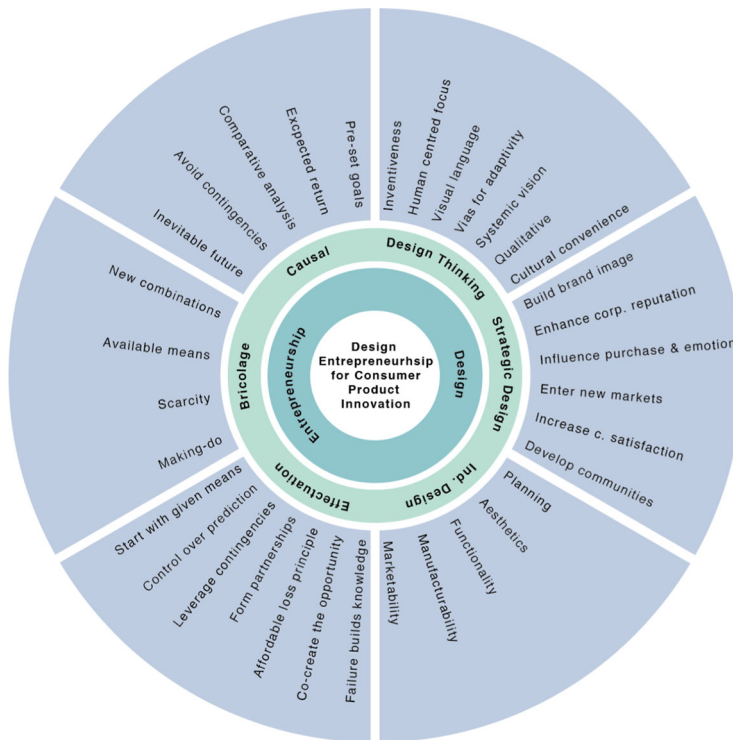


Figure 1.

The Design Entrepreneurship for Consumer Product Innovation typology (adapted from Valencia et al. 2018).

The thinking of designers

Cross (2011) studied designers' behaviour to understand how designers approach problem finding and problem-solving. He highlighted that the more designers develop the product, the more they understand the problem. Schön (1987) explained design as a reflective practice, referring to design as an activity that involves reflection-in-action and knowing-in-action. The generation of knowledge for designers is a hands-on interaction between doing and learning.

Owen (2007) classified individuals as *makers* or *finders* depending on the content and the process, which they use to generate knowledge. The makers, also known as inventors, are driven by the synthesis of ideas and their transformation into new concepts, products, patterns, or constructions; the finders research specific areas to advance their knowledge and make discoveries. In this cycle, knowledge is used to produce work and work is assessed to produce knowledge (Razzouk and Shute 2012). Based on Owen's (2007) theory, Figure 2 shows a vertical axis dividing the analytical (finding) process and the synthetic (making) process. A horizontal axis divides the figure representing the symbolic and the real context. The symbolic side relates to the representation and construction of abstract ideas, while the analytical side refers to the use of logical reasoning.

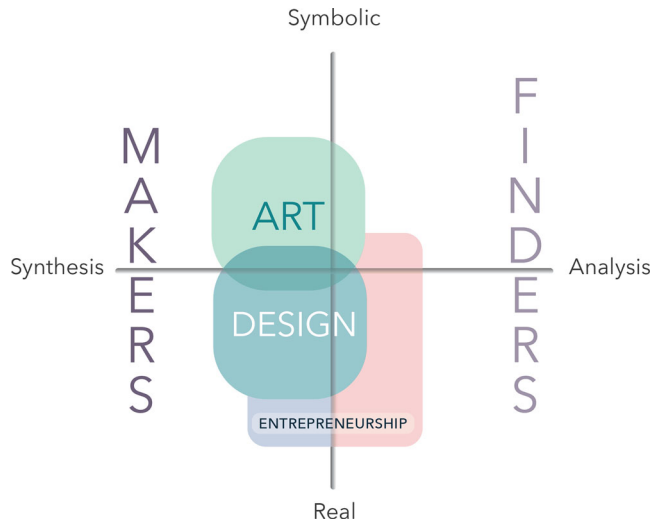


Figure 2. The entrepreneurship discipline added to the map of fields created by Owen (2007).

Areas of knowledge in the upper half of the map are more concerned with the abstract, symbolic world, and communication. Fields in the lower half are concerned with the real world, the artefacts, and the systems necessary for managing the physical environment.

Designers (design field in Figure 2) tend to work mainly in the synthetic-real bottom left quadrant (but not exclusively). Artists (art field in Figure 2) incline to work more in the symbolic-synthetic upper left quadrant. Entrepreneurs (entrepreneurship field in Figure 2) work predominantly in the bottom quadrants. Art and design education share an affinity for studio culture, divergent thinking, aesthetic studies, stimulating creative approaches, encouraging the acquisition of independent judgement and critical self-awareness (Souleles 2013) — practices in the synthetic side. However, the attention of the design professions has long been directed at very real problems and opportunities to bring new products to market. Therefore, designers are closer to product innovation than artists, for example. The repeated cycles of creation and testing in design move back and forth from the synthetic-symbolic to the synthetic-real quadrant. Compared to artists, the designers carry more responsibility for materializing their proposals within commercial and technical constraints and in the context of mass manufacture, where the impact of their decisions is amplified. Despite evident strengths in the analytical-real domain, the public identity of the design discipline continues to be characterized by its emphasis on the creative and visual elements. As a result, although Owen asserted that novel ideas could happen in any of the quadrants, the underlying doctrine around the designer as a creative, or the designer as a maker, makes it harder for designers to embrace the value of more systemic and analytical approaches.

Owen's characterization of designers as makers can be related to the cognitive ease of designers. Cognitive ease refers to how easily someone's brain can process information; it does not require extra attention or extra mental work. Conversely, cognitive strain requires more attention, forcing the mind and making it work harder (Kahneman 2011). Cognitive ease impacts how someone feels about new information or activities (Schwartz and Cuadros 2017).

Research methodology

Grounded Theory is a methodology to approach qualitative research, focusing on creating frameworks and theories based on an inductive analysis of the data. This methodology is appropriate when little is known about a phenomenon. The aim is to develop a theory on a subject grounded in the data (Glaser and Strauss 1967). To develop a new theory, the researcher does not begin with previous research on the topic to avoid biases. This method consists of a systematic approach to inquire about reality by constructing a new theory that emerged from the data.

The Constructivist Grounded Theory (CGT) uses the Grounded Theory rules and treats them as flexible guidelines, allowing multiple realities and the researchers' subjectivity in the study (Charmaz 2000). The multiple perspectives create a context that makes the 'theory richer and more reflective of the context in which participants are situated' (Mills, Bonner, and Francis 2006, 28). CGT encourages the researcher's previous exposure to the available literature and the use of theoretical frameworks to guide the development of research for novice researchers (Nagel et al. 2015). CGT encourages the researcher to conduct research beforehand and be flexible in the data generation model, asking off-script questions and bringing spontaneous reflections to the interview. Constructivism acknowledges that the researcher's interpretation of the studied phenomenon is itself a construction (Charmaz 2006).

The CGT provided a research method consistent with the study's purposes and conditions because a) it acknowledged the research team's previous experience (in design and entrepreneurship); b) it was also more interested in 'the views, values, beliefs, assumptions and ideologies of individuals rather than the methods of research' (Creswell 2013, 87); therefore, it could be used to understand the mindset transition of D-entrepreneurs; c) it allowed multiple perspectives on the research topic; therefore the voices of academic experts in design or entrepreneurship, investors and non-D-entrepreneurs could also be considered to understand the entrepreneurial journey of designers; d) it was more responsive to new insights and emergent questions since simultaneous data generation and analysis have an immediate impact on the research (Charmaz 2006, 2008)

Research method

An analysis of relevant literature on design and entrepreneurship preceded two phases of data generation. The first phase of data generation explored broad groups of the supporting environment of D-entrepreneurs (academics, investors, non-D-entrepreneurs, heads of e-commerce and a crowdfunding company), to have a more rounded vision of the design entrepreneurship landscape. These participants provided the context to the study. The second phase of data generation focused specifically on designers and their transition to becoming entrepreneurs. For the trustworthiness of the study, the authors of the study followed up the approach of design entrepreneurs from phase two, one academic expert in entrepreneurship and one manager expert in NPD.

Sampling

Contemporaneous with the primary research, a design investment fund and an influential design charity in the UK held two entrepreneurial competitions for product designers. These organizations supported the lead researcher, acting as intermediaries to recruit participants for phase one. They also helped with the referral of e-commerce and crowdfunding platforms oriented to product design. Participants in this study were contacted via email and digital social media platforms such as LinkedIn. The criteria for this phase looked for members from the entrepreneurial supporting environment for designers. To be included, participants had to be working in product-based start-up (tangible product) and have experience with either NPD or NVC. [Table 1](#) presents a summary of the interviewees in the two phases of the study.

For the second phase of data generation, seven D-entrepreneurs from phase one remained in the study. The criteria for phase two looked for D-entrepreneurs working in a product-based start-up (tangible product), with at least one product in the marketplace at the time of the interview. D-entrepreneurs in the study came from the following industries: kitchenware, housewares, baby products, IoT products, bicycle accessories, trainers, furniture and tech gadgets. Consequent follow-up interviews with the participants after the initial engagement were held to confirm theoretical saturation and trustworthiness.

Data generation methods

Phase one

Based on DECPI typology, phase one of the study created a semi-structured interview model to understand the latest insights into design and entrepreneurship from participants from the entrepreneurial supporting environment for designers. It also aimed to understand the first-hand experiences of the D-entrepreneurs themselves.

Table 1. List of interviewees from phase one and phase two.

<i>Study phase</i>	<i>Number of participants</i>	<i>Role</i>	<i>Data generation method</i>
One	4	Academic experts in design	A semi-structured interview, including relevant off-script questions and spontaneous reflections.
	11	Designer-entrepreneurs	
	7	Academic experts in entrepreneurship	
	4	Product-oriented investors	
	4	Non-Designer-entrepreneurs	
	5	Heads of incubation and acceleration programmes	
	1	Head of a crowdfunding platform	
	1	Product Design Manager	
Two	7	Designer-entrepreneurs	A semi-structured interview focused on the entrepreneurial journey followed by a visual map of milestones and a think-aloud protocol.

Key sources of insight in the first phase were those participants within the entrepreneurial supporting environment for designers, who had observed people from a range of backgrounds through their entrepreneurial journeys. For example, one participant had collaborated with entrepreneurs in the product realisation stage of their journey. He had collaborated with several D-entrepreneurs and non-D-entrepreneurs. Similarly, some of the investors in phase one had the advantage of having been funded and been able to observe the contrasts in the approach of these diverse types of entrepreneurs.

Phase two

Two semi-structured interviews in phase two were conducted focusing on the entrepreneurial journey of each designer. In a subsequent meeting, a visual map of product and start-up milestones was conducted to know more about the sequence of events in their journey. At the same time, a think-aloud protocol (Ericsson and Simon 1980) brought more reflection and clarity into what occurred at each stage in their journey. The visual map (left-hand side of [Figure 3](#)) consisted of 24 possible milestones describing the NPD and the NVC. These milestones came from the combination of the elements of the eight innovation processes from Salerno et al. (2015), the Lean Startup

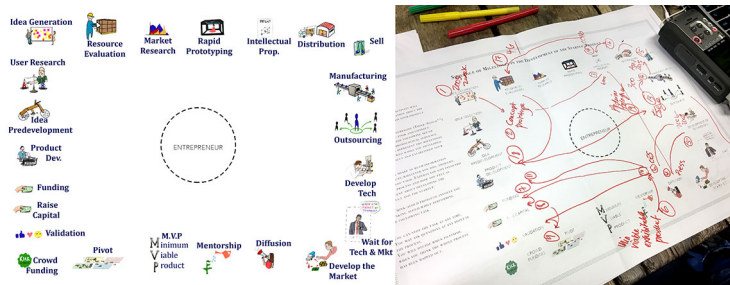


Figure 3. Visual maps of product start-ups milestones (left image shows template and the right image shows an example of a completed map during interview process).

methodology (Ries 2011), the start-up evolution curve (Jonikas 2017) and the pre-production milestones of manufacturing products (Henning 2020). The right-hand side of Figure 3 shows the result of the activity.

The participants were asked to connect the events in chronological order while they verbalized their decisions, achievements, pivots, iterations, and challenges in their entrepreneurial journey. The gathered data was summarized in a timeline to visualize the milestones within the entrepreneurial journey. In a consequent meeting, the transcripts and the visual timeline were shown to the participants to confirm that the researcher accurately captured the information. These meetings contributed to the study’s trustworthiness. Jacelon and O’Dell (2005) indicated that prolonged engagement with participants improves the study’s internal validity. The entrepreneurs each had 4-6 weeks between their first and second (follow-up) interviews, to verify transcripts and ask further questions.

Data analysis

CGT recommends collecting data and its simultaneous analysis before collecting the entire sample, thus enabling conceptualization of the phenomena (Charmaz 2008). This approach shaped the type of data needed in the current study and how and when to collect it. Coding and memos were aligned with CGT conventions for the analytical phase (Charmaz 2008). CGT has two coding levels. Initial coding defined core categories used grounds to portray people’s actions and detected relationships between the codes and the larger image of the study. Focus coding used the most significant and relevant codes from the initial codes (Kimani 2013).

The initial analysis of the transcripts for both phases was conducted line by line with each interview. Each one of the codes was labelled in the initial coding, followed by the focused coding. The first data collection used the DECPI typology as a guide for the inquiry. Whilst many of the emerging phenomena were explained by the typology, some were not, and therefore a range of new codes was used. In phase one, the participants drew a comprehensive vision of

the supporting environment for designers. The data gathered in this phase was broken into individual phrases and coded before integrating the data into substantive themes. A qualitative data analysis software (NVivo) was used to organize, manage, and consistently code the data throughout the analysis.

In phase one, initial coding captured several new insights that had not been considered in the theories covered by the DECPI typology. Analysis of data from these codes revealed themes addressing the importance of the designer's transformation in the entrepreneurial journey. D-entrepreneurs contended with competing priorities during the progression towards NVC. Their attention to detail and focus on mastery and perfection of execution was challenged when dealing with business-oriented activities. They tried to balance their propensity to pursue the optimal product with increasing recognition of, and responsibility for, the array of commercial constraints. This change in their mindset was identified as a potentially important finding, indicating a significant subprocess of design-entrepreneurship and the designer's entrepreneurial journey.

In phase two, focus coding allowed the researchers to explore this journey more in-depth with the D-entrepreneurs to reveal more about the role of mindsets. Themes such as 'flowing' and 'crafting' comprised the mastering design skills, detail orientation, and aesthetic obsessing codes in the early days of the journey. The 'configuring a product' theme revealed the slight deviation of priorities from doing a personal project to building a product. The 'opportunity building' theme exposed designers' colliding priorities when they realised the product had business potential. The shift in priorities made evident the breaking point from product-oriented to business-oriented activities. It comprises codes of acquiring new skills, dealing with uncertainty and confusion, prioritizing activities, and listening to clients' feedback. The 'expert designer-entrepreneur' theme revealed the adoption of more business constraints into D-entrepreneurs' design practice at a later stage of the start-up. Codes such as 'leading through design' and 'embracing businesses supported this theme. [Figure 4](#) shows an extract of the subprocesses of one of the D-entrepreneur's journeys, the top row represents the NPD subprocess, the middle row shows the NVC subprocess and the bottom row represents the DMT subprocess. The visual map was reutilized as an analytical tool to help disentangle the three subprocesses.

Findings

Evidence in this study has shown that the DMT is an important subprocess in design entrepreneurship. The evidence was drawn from a modest number of interviews and workshops with D-entrepreneurs. Nevertheless, it was supported by evidence from interviews with experts experienced in helping several entrepreneurs from differing backgrounds.

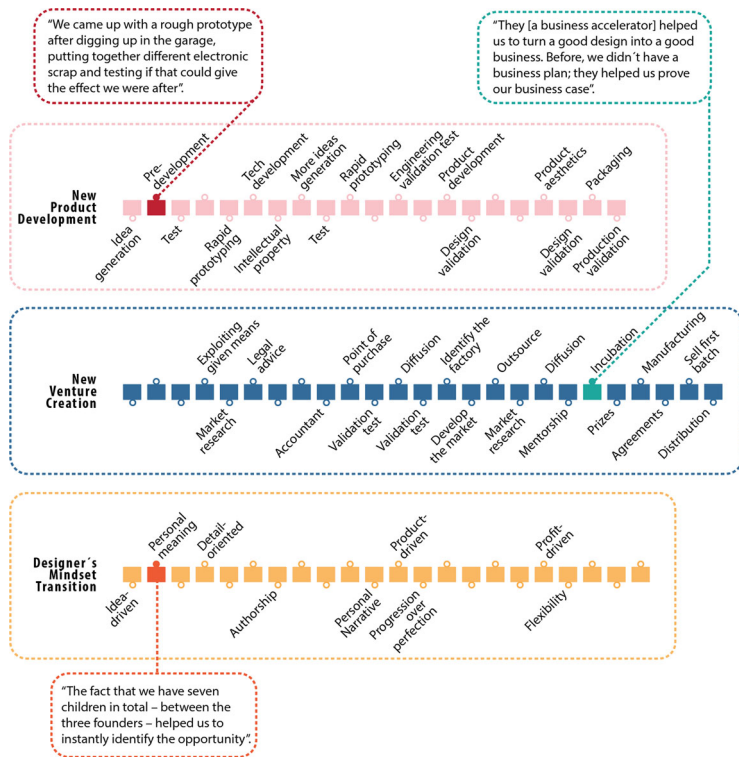


Figure 4. Participants' entrepreneurial journey disentangled into the three subprocesses.

The findings suggested that changes developed in how D-entrepreneurs prioritized competing demands during their engagement with the entrepreneurial process. The D-entrepreneurs gradually adapted their logic, actions, processes, and priorities towards a more business-savvy analysis to grow and refine their business without losing their design intentions for the overall product/business development. When the findings were organized chronologically, they suggested four zones of changing focus necessary to move from conceptual thinking through to the final, commercially oriented decision-making. These four zones were termed as D-entrepreneurs' mindsets.

The four D-entrepreneurs' mindsets

Evidence in the study demonstrated an ongoing transition in thinking experienced by D-entrepreneurs throughout the entrepreneurial journey. Therefore, we proposed four D-entrepreneurs' mindsets to conceptually represent this transition. The mindsets defined through this study were labelled as the *Artisan*, the *Configurator*, the *Opportunity Seeker*, and the *Design Leader* mindsets. The four D-entrepreneurs' mindsets were not mutually exclusive, they were symbiotic. However,

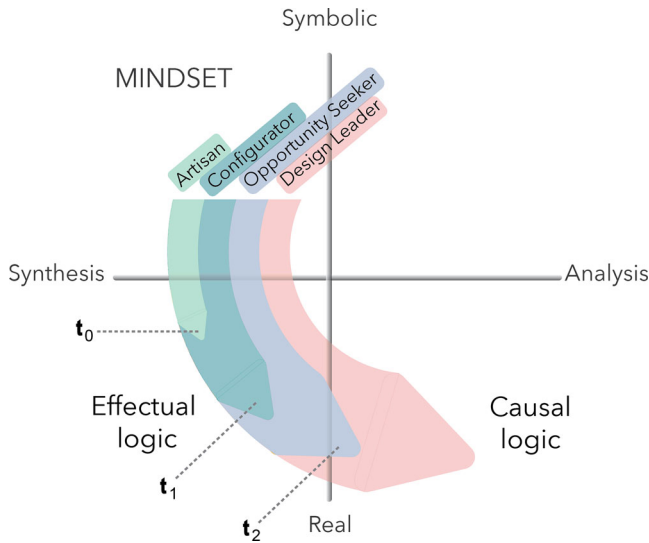


Figure 5.

Transitional stages in the Designer-entrepreneur's Mindset delineated by trigger points t_0 , t_1 , t_2 (building on Owen [2007]).

we suggested that their weightings changed in importance as the commercial activities of the venture developed.

Artisan mindset

In the preliminary stages of developing the venture, D-entrepreneurs often invested time and energy sketching multiple concepts, crafting, and honing the product idea before considering potential commercial constraints. Figure 5 illustrates the Artisan mindset, where the D-entrepreneurs' priority was to experiment and become skilful with materials or technologies. It is where playing with innovative technologies and new materials took place, with the designer prioritizing the creative exploration of materials, technologies, forms, shapes, textures, and aesthetic properties. Some of the D-entrepreneurs in the study had minimal evidence of what they were developing that would appeal to their anticipated target customer in this early stage. This was contrary to what design thinking claims (start with a deep dive into the user's needs). In this study, the evidence suggested that the designer's sense of purpose or passion led the entrepreneurial path in the early days, not through a systemic understanding of users.

Configurator mindset

D-entrepreneurs altered their focus once they realised the potential of the product. Figure 5 shows the Configurator mindset, where the D-entrepreneurs' priority was to find the value proposition and integrate the product into a more extensive system. This mindset is where the configuration of the product and the initial business model

was explored. D-entrepreneurs' evident reluctance to explore the business requirements, made them focus on the product's configuration and understand the problem they were addressing. Some participant D-entrepreneurs acknowledged their primary focus on the execution of their vision without a timeframe. This stage turned out to be critical for attaining coherence between the entrepreneur's aspirations and the product.

Opportunity seeker mindset

D-entrepreneurs presented a change in their mindset once they decided to develop the business. In the Opportunity Seeker mindset, in [Figure 5](#), the priority was to automate the process to gain speed and attract investment. Flexibility in the management and delegation of the task provided D-entrepreneurs with the advantage of steering the company. The focus was to set up a business capable of growing and competing in a market. In this mindset, the development of the product and the start-up's development happened almost in parallel. The activation of this mindset does not mean the other mindsets shut down, but they become less of a priority for the D-entrepreneurs in that specific moment. The Opportunity Seeker mindset examined every opportunity to increase sales, improve margins, automate processes, reduce waste, and gain access to more money. The main objective of this stage was to constantly look for mechanisms that supported the business's growth, such as accelerators and incubators.

Design leader mindset

D-entrepreneurs' mindsets changed after growing the start-up, setting up the basis for scaling up the business. Under the Design Leader mindset, in [Figure 5](#), the start-up focused on increasing their market share, introducing more product range, or diversifying into neighbouring markets. The priority was to have a product-business model that can be replicated or adapted in other countries. There was a virtuous cycle, where the business informs the design, and the design informs the business. The mindsets build on each other and avoid conflict by prioritizing whether the product decisions affected the business or vice versa. The designer's transformation into a business-savvy entrepreneur reached a new level when designers practised balancing product and business demands. They delegated the day-to-day operations of the start-up to concentrate on its strategic direction. It was also evident that D-entrepreneurs drew on their innate user-centricity and their visual and storytelling skills to secure investors and business partners. [Table 2](#) shows the salient mindset categories and themes coming from phase two of the study.

Table 2. Categories, themes, and descriptions emerging from phase two of the study.

<i>Mindset Category</i>	<i>Theme</i>	<i>Description</i>
Artisan	Flowing and Crafting	Designer-entrepreneurs found meaning, purpose, and gratification in mastering new techniques, honing their taste, experimenting with innovative ideas, exploring the boundaries of their skills, and their early objects' characteristics.
	Playing it by ear	They developed the idea based on their likes and needs with no market or business acumen whatsoever. There were no user's needs involved.
Configurator	Killing the darlings	Self-expression was no longer the primary goal. The priority was to design a product, solve a problem and identify the value proposition.
	Configuring a product	Designer-entrepreneurs focused on the configuration of the product and understanding the problem they were addressing.
	Exploring boundaries	Acquiring new business and management of knowledge was not a priority at this stage, as the trial-and-error approach helped to settle the product's key features and the start-up.
Opportunity Seeker	Gathering resources	Designer-entrepreneurs now realised the importance of their product/venture, they seek to attract resources to the venture in terms of finance, knowledge, networks, suppliers, retailers, grants, contests, and diffusion.
	Empowering a team	Delegating results in the Designer-entrepreneurs sacrificing full control over the product; however, the time and focus gained to boost the venture's performance allowed the entrepreneur to spend more time seeking out opportunities to help the business grow.
Design Leader	Leading through design	Design is seen as a strategic differentiator in the industry. Designer-entrepreneurs set up a vision about where their product and business needed to be in the future. The lack of confidence in using business language, identified in earlier mindsets was replaced by an effective and confident use of business and technical vocabulary.

The mindset triggers

Figure 5 illustrates three triggers (t0, t1 and t2) representing the tipping points between the four mindsets described above. The first trigger (t0) is the transition from the Artisan to the Configurator mindset, expressing the readiness for a change. The second trigger sits between the Configuration and Opportunity Seeker mindsets (t1) and represents the realisation that the product can reach an audience who is willing to pay for it. The third trigger is between the Opportunity mindset and the Design Leader mindset (t2). Designers with this mindset made design decisions based on business performance and metrics. They had a vision for where the business should be in the future.

Discussion

The 'designers' mindset transition' theory

DMT theory is the explanation of the DMT subprocess. The DMT theory has its underpinnings in the cognitive ease that designers feel about certain activities. Designers in this study tended to focus on the qualities of the artefact, with only cursory consideration of business requirements in the initial stages of their journey. This showed that they moved from an effectual to a casual logic. Existing theories of NPD and NVC do not discuss the disciplinary paradigms of the entrepreneurs they guide, such as priorities, interests, and beliefs but provided a common set of steps for all-comers. As such, the four mindsets and the DMT subprocess described, added a third layer of understanding to the current discourse, supporting NPD and NVC. When designers adopted an analytical approach to business without gradually achieving the Opportunity Seeker mindset, the designer's natural flow was interrupted, breaking down the consistency with which designers think and act, referred to as cognitive strain. The transition of the designer's mindset gradually enabled activities, tools, and processes outside of the design discipline, such as business planning, forecasting and finances, referred to as cognitive ease by Kahneman (2011).

Designer's cognitive ease and strain

As designers moved through the start-up journey, decisions had a more significant impact on the company's future. As the risk became higher, there was a greater need for a more structured and systemic approach to setting up the business and drawing upon opportunities. It is worth noticing that D-entrepreneurs' hands-on nature at the beginning of the start-up clashed with the more analytical tasks required at later stages. Effectuation focused on the controllable aspects of an unpredictable future, and causation concentrated on the predictable aspects of an uncertain future (Sarasvathy 2008).

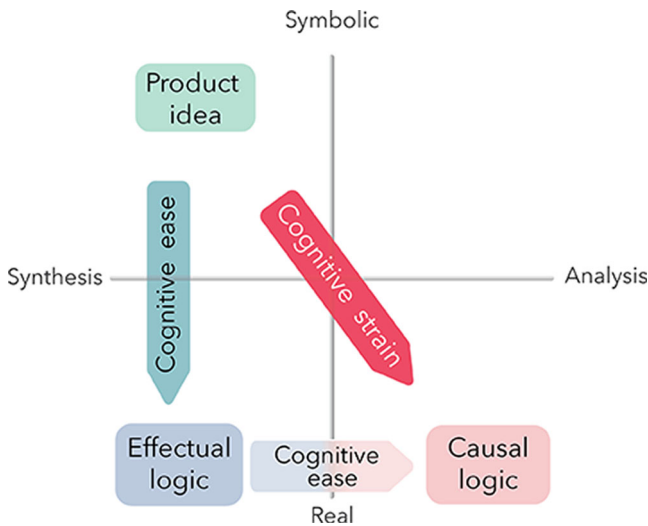


Figure 6.
The path of cognitive ease and cognitive strain for D-entrepreneurs.

In Figure 6, the vertical arrow depicts how designers find cognitive ease with the effectual logic due to the discipline's flexible and explorative nature. Conversely, when designers needed a more structured approach to decision-making, there was a mental and physical discomfort shown by the diagonal arrow in Figure 6. Additionally, analytical business decisions and market analysis clashed with the designer's existing ways of knowing and doing. Causal logic created cognitive strain between the designer's interests and business needs. It was suggested by the evidence in this study that designers managed to overcome the mental discomfort of the analytical business decisions by gradually evolving their logic from effectual to causal and transforming their mindset from artistic to opportunity seeking. This transition was influenced by the maturity of the business and the ambition of the D-entrepreneurs. D-entrepreneurs in the current study acquired new knowledge in the business domain during the transition from the Configurator to the Opportunity Seeker mindset. Consistently with Sarasvathy (2008), entrepreneurs sought ways to back up their decisions whenever those decisions could compromise the company's future. In other words, the bigger the business decisions, the more support was required from business tools.

Practical implications

Designers may be experts in developing new products and have a feel for business potential but lack the business focus and acumen needed to realise it. The four mindsets and the transition points described in this study clarified the designer's experience of entrepreneurship. The DMT theory illustrates that a designer starting up a company was prone to experience cognitive strain (the reluctance to

perform actions outside of their expertise) if they followed a goal-oriented and business-driven logic – causal logic (Sarasvathy 2001). However, the DMT subprocess showed the sequence of mindsets that designers used to gradually migrate their design-oriented focus to an entrepreneurial focus following an experiment-oriented and hypothesis-driven logic – effectual logic (Sarasvathy 2001). An understanding of the four mindsets can help both prospective and active D-entrepreneurs reflect on their capabilities as potential business leaders. Others in the entrepreneurial support environment and education will value them as a guiding framework for supporting designers' entrepreneurial journey. This ranges across business incubators, investors, policymakers, and educators. Larger organizations will find the results of this study and the insights it provides about the four mindsets useful in guiding intrapreneurial behaviours within their in-house creative teams.

Limitations of the study and further research

A limitation of the research is its dependence on the accurate recall of events by the participant D-entrepreneurs. A further longitudinal study, following D-entrepreneurs in real-time as they navigate the transitions described would complement the current research. Through this qualitative study, now that a framework for the four mindsets of the D-entrepreneurs has been outlined, a larger scale quantitative approach can follow to engage a wider set of participants and to evaluate the model proposed here.

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