

On IP and secrecy

The relevance of intellectual property rights to design-led start-up businesses

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Abstract: This paper discusses how design-led start-up businesses can enhance their growth potential through securing exclusive access to intellectual property (IP). Many design-led start-up companies commonly see themselves confronted with a dilemma in that they require funds for design development as well as for overheads on the one hand, and for IP on the other. In search for an answer to the question whether or not a patent constitutes a useful and cost-effective means for start-ups to overcome competition and to secure equity investment, this paper will show a range of case studies of award winning British designs. The paper relies on the comparative study of interviews with design entrepreneurs to identify how designers can optimize the form and timing for IP protection for their start-up businesses.

Key words: *intellectual property, design, entrepreneurialism, business development, exclusivity*

1. Introduction: Towards a definition of the designer entrepreneur

Entrepreneurialism is commonly associated with pioneering efforts and risk-taking in conjunction with business development. Whilst embarking on a design career, can be perceived as a risk per se due to the high level of competition in the field, design entrepreneurialism can be understood as a business-facing approach to design that is needed for initiating high-growth business developments. High growth cannot be achieved through a consultancy business. Instead designer-entrepreneurs need to conceive products or services, which they themselves take to market. The growth potential of such initiatives lends itself for raising equity investment, which in turn allows for the business to continue growing. But first let us establish what constitutes design or a design-led venture:

1.1. Design:

The Cox Review of Creativity in Businesses, which was commissioned by the HM Treasury and published in the UK in 2005, defines ‘Design’ as that which links creativity with innovation. Cox describes creativity as ‘the generation of new ideas’, which lead to ‘new ways of looking at existing problems, or of seeing new opportunities, perhaps by exploiting emerging technologies or changes in markets.’ [2] Design on the other hand is seen as the process of shaping ‘ideas to become practical and attractive propositions for users or customers. Design may be described as creativity deployed to a specific end.’ [2] Innovation, according to Cox, consists of ‘the successful exploitation of new ideas. It is the process that carries them through to new products, new services, new ways of running the business or even new ways of doing business.’ [2] It is easy to see that this notion of design is rather open. Whilst Cox acknowledges the fact that ‘It is common for those in business to see creativity and the related area of design as largely concerned with aesthetic considerations such as style and appearance’, he proposes for

creativity instead to be seen as a ‘path to new products and services’ and as a ‘route to greater productivity’. He further emphasises that “‘Creativity’ cannot be viewed as a skill possessed by the gifted few. It needs to pervade the thinking of the whole business ...’ [2] The designer-entrepreneur is confronted with numerous challenges over and above the design of the product or service. Who to work with? How to access target markets? How to brand the venture? How to budget? How to raise funding? How to find business partners and collaborators?

1.2. Design entrepreneurialism:

Usually professional design activities are triggered by a commission, to which designers or design agencies respond with the provision of design services. The results of these design activities are tailored towards the needs and expectations of the individual customer here. However, design-entrepreneurial initiatives mostly surround an independently developed design concept that is taken to market by the designer, who is not only the inventor of the concept but also in charge of commercialising the invention and of developing the surrounding business. The designer-entrepreneur may work alone or assemble a business start-up team. Start-ups are developed from scratch, as opposed to spin-outs that are grown within larger institutions to become independent at a later stage. The term “design-led start-up” will be used further down in reference to start-up companies, the development of which has been initiated by one or several designers. Designer-entrepreneurs must make sure that their design concepts are of potential benefit to a wide target audience so that the business can expand. “Concrete canvas”, for example, is an exceptionally versatile invention that can be deployed for multiple purposes. The “concrete canvas” is a flexible cement impregnated fabric, which was invented in 2004 by Peter Brewin and Will Crawford, who met at the Royal College of Art. Initially the team designed concrete shelters to be used in disaster zones. However, the inventors extended the application of their technology beyond its originally intended use. Their concrete canvas is now also used for lining ditches, protecting slopes, roofing, to name but a few applications. Expandable design business cases are also found in the field of fashion, furniture design as well as in the entertainment industry. However, it is important to emphasise that this paper does not discuss IP strategies that are inherent to the latter disciplines. The modus operandi surrounding IP here differs significantly from that of technology-based design businesses. Due to the rapidly changing product portfolios of fashion and entertainment companies, and due to the pace at which these products are consumed, these industries relies largely on heavily-policed copyrights and branding in order to secure exclusivity on the market. Technology-based design companies, on the other hand, tend to rely more on registered designs and patents in order to edge their way into the market.



Figure.1 Concrete Canvas used for lining a slope

2. The landscape for designer-entrepreneurs

So what exactly facilitates the success and growth of a design-led start up? In 1986 David J. Teece introduced us to the term “appropriability” which sums up ‘the environmental factors... that govern an innovator’s ability to capture the profits generated by an innovation.’ [9] As the most important factors in this respect, Teece lists ‘the nature of the technology, and the efficacy of legal mechanisms of protection.’ Teece criticises patents for being of limited benefit in a lot of cases. He states that ‘Many patents can be “invented around” at modest cost.’ He also discusses the relevance of other business activities, such as ‘marketing, competitive manufacturing, and after-sales support’ [9] to succeed in business. Appropriability comprises numerous factors, IP being one of them. Teece juxtaposes *tight* and *weak* appropriability regimes, whereas ‘Tight appropriability is the exception rather than the rule’. In addition to the dialectical juxtaposition of tight and weak appropriability regimes, Teece distinguishes between fully integrated ventures, and those who rely on contracts in order to access “complimentary assets”. Complimentary assets is another term coined by Teece to sum up the ‘additional resources and capabilities needed to bring a technology product to market’ [9]. These may comprise components that cannot be produced in-house, customer relations, service expertise etc. The lack of control over required complimentary assets, can lead to bottlenecks in the value chain, both upstream, i.e. towards the supply of materials and components, as well as downstream, towards the end customer.

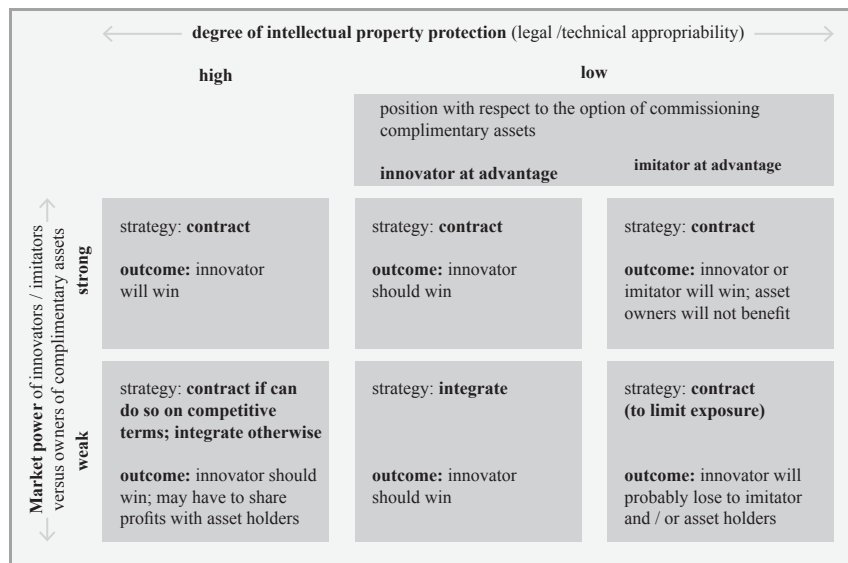


Figure.2 Teece model

If the market power over complimentary assets is tightly controlled through independent asset holders, and the new venture is not fully integrated, Teece’s model suggests that the entrepreneur relies inevitably on the collaboration with those who control the complimentary assets needed. In this case tight appropriability is essential for the design-entrepreneur to succeed with the business. Weak appropriability in combination with a market that is tightly controlled through independent businesses is likely to lead to the failure of the invention, because independent businesses can easily imitate or circumvent the invention in order to compete with the design entrepreneur. Focusing on a market niche that is ignored by competitors, can sometimes enable a designer-entrepreneur to obtain control over complimentary assets needed within this particular niche.

In order to better understand how IP can affect the growth potential of a design businesses, we shall look at Clarysse / Kiefer’s entrepreneurial strategy matrix, which juxtaposes low and high environment complexities (structure) along one axis, and low and high environment uncertainties (inaccessibility) along another. The term business environment is understood here as ‘a chain of players who carry out different value-adding functions in a products journey to the end market’. [1]

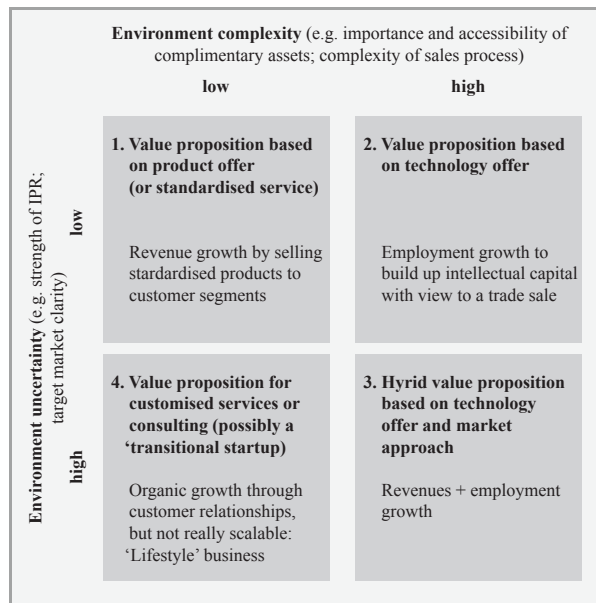


Figure.3 entrepreneurial strategy matrix (abbreviated)

The entrepreneurial strategy matrix produces 4 quadrants, within which companies of different growth potential fall. Companies located at the top left (quadrant 1) are facing low environment complexity and low level of market uncertainty. In other words the target markets for these companies are very clear in terms of structure and easily accessed. According to Clarysse / Kiefer formal IP is usually not required to succeed here. It is important to note that formal IP comprises both registered and unregistered IP, where-as ‘informal IP’ is not IP in the strict sense, but consists of informal appropriation mechanisms such as ‘secrecy, confidentiality agreements, lead time, and complexity (of design)’ [7]. Companies located in the 1st quadrant tend to ‘operate independently without the need for partnerships’ through ‘direct and trusted relationships with customers’ [1]. The British engineering firm Dyson would be located in this part of the diagram, where most of the firms manufacture their products themselves. In other words they are product-led. Quadrant 2, located on the top right, hosts businesses, the environment uncertainty of which is also low. But the complexity is high. This means that there are numerous market players, different possible market entry points and partnering with existing key players in the market may be essential for new businesses to succeed. To secure one’s position on the market, IP is very important here. This is usually the kind of situation, which a design-led start-up aspires to reach prior to its trade sale. The more novel a design-led invention is, the more complex the environment will be, due to the fact that the technology is yet to be proven in terms of its application. Design-led start-ups seeking to trade directly, need to establish distribution channels. Those who prefer to grow through licensing their technology, need strategic partners to secure their

place in this part of the matrix. Quadrant 3 is located in the bottom right, where we find businesses, the environment of which is both highly uncertain and highly complex. The lack of environment certainty here may be due to the fact that the design product is underdeveloped, awaiting proof of market for example, or it is difficult to protect from imitation. This is the case with many service design concepts and software developments, for example. But also technology design solutions may be located here during the early stages of the business development. The fourth quarter that is located at the bottom left of the matrix, hosts businesses facing a highly uncertain environment, whilst the environment complexity is low. Clarysse / Kiefer identify this area as the situation for most 'customised services or consulting' firms. Standard design agencies that supply their customers with bespoke services upon commission are usually positioned within this sector of the entrepreneurial strategy matrix. Most design consultancies across the spectrum, product design firms, service design consultancies, advertising agencies, graphic design and branding firms, fall into this category. The problem here is that the scalability of the businesses is very limited. Companies can only grow proportionally to the number of clients, with whom they have direct contact. As the service provided by such companies is hardly ever directly transferrable from one customer to another, the growth potential of the conventional design consultancy is very limited. Clarysse / Kiefer refer to this sort of company as a 'lifestyle' business, which can only possibly expand through franchising the brand name. In other words the growth potential of standard, i.e. consultancy based design businesses is very limited by comparison to technology-based businesses (quadrant 2 and 3) or product-based businesses (quadrant 1). The only way for designers to escape quadrant 4, it seems, is to come up with a technological novelty, which allows for design-led start-ups to move into quadrant 3, and subsequently through securing exclusive IP and through establishing sufficient industry links, progress into quadrant 2.

3. The relevance of IP

In their book, 'The Smart Entrepreneur', Clarysse and Kiefer claim that 'Patents are particularly important when your business is not close to market, because the exclusivity afforded by a solid patent can buy you some time by preventing competitors from encroaching on your idea while you develop applications.' [1] One may want to contest this statement. After all a patent application sets the clock ticking. Within 18 months the invention is publicised and the business intention made clear to potential competitors. Even though competitors are not allowed to exploit the invention without the patent holder's consent, they may be able to circumvent it through alternative technology solutions. Filing a patent application also entails a whole string of events, which cannot be delayed, and which entail costs. Patent protection policies may be needed to cater for the event of infringement through third parties. Company directors may need protection through a directors and officers liability insurance. Within twelve months from filing a national application, a decision must be made whether or not to take the patent global, either through filing a PCT (Patent Cooperation Treaty) application, or through applying in foreign countries directly. Then costs are likely to spiral, and development budgets need to grow accordingly. Therefore the UK Design Council suggests to 'Approach patenting with caution. Multinational cover is expensive and premature filing can do more harm than good' [11]. Some patent attorneys advise to delay patent applications as much as possible, partly because the validity of a patent is limited to five years. Through renewals the lifespan can be extended to 20. However, every year counts in terms of commercial exploitation, and the period of possible

exploitation is cut short if a patent is filed prematurely. An aspiring designer-entrepreneur may also wonder to what extent his or her patent can be enforced if challenged. Clarysse and Kiefer admit that ‘...a patent suit can cost \$10-15 million and drag on for several years’ [1]. This beckons the question as to what is the best IP strategy for a design-led start-up.

4. Case studies

In pursuit of this question, 4 designer-entrepreneurs have been interviewed with respect to their experience with IP. All 4 designers have been through a business incubation process of some kind. Two of the ventures were incubated by Design London, which was a 4-year joint initiative between the Royal College of Art (RCA) and Imperial College London (IC). Design London was funded by the National Endowment for Science, Technology and the Arts (NESTA) and the Higher Education Funding Council for England (HEFCE), but closed in 2011. The other two ventures are currently incubated by the InnovationRCA Incubator.

4.1. Arctica



Figure.4 Arctica cooling system

Arctica was a venture that was amongst the second wave of incubatees at Design London. The inventors and original team members, Karina Torlei, William Penfold, Daniel Becerra and Mathew Holloway, met when studying Industrial Design Engineering at the Royal College of Art and Imperial College in 2006. During a networking event in October 2008 they joined forces with Matthew Judkins, who studied for MBA at the Imperial College Business School in London. Arctica is an environment friendly cooling system that does not use any toxic gases, ‘requires less than 10% of the energy of a conventional air conditioning system, and can easily be installed in new or existing buildings.’ [15] In the course of the night a thermal battery stores low temperature through freezing a phase-change material, which absorbs the warmth of the air indoors during the following day. This reduces temperatures to about 20-25 degrees Celsius. Running costs are very low, as are the costs involved in product servicing and maintenance. In October 2008 Arctica entered the Design London Business Incubator, from which it exited in May 2010. Later that year it was sold to Monodraught Limited. The system is now being traded under the name Cool-Phase®. The start-up team filed their first patent in February 2008, and their PCT 12 months later. All members parted with the venture following its sale, except Matthew Holloway and William Penfold, who worked for the acquiring company for a period of time.

Given its comparatively short development period, one is inclined to wonder, whether such a rapid success would have been possible without exclusive IP. Arctica established a strong appropriability regime through filing 3 patents, which they extended through PCT applications. However, the inventors found themselves confronted with a bottleneck in their downstream value chain. In the UK air conditioning systems are commonly fitted by so-called HVAC (heating, ventilation, and air conditioning) fitters and distributors. Selling Arctica directly to property developers was impossible. So a distribution channel, a key complimentary asset, could not be established here. The team consequently focused on a niche market and marketed their product to the owners of listed and period properties, where the installation of conventional air conditioning systems is either legally prohibited or technically difficult. Following some initial successful trials, which proved the viability of the product, Arctica were approached by Monodraught Ltd. What Arctica had done, was to gain control over a larger section of the value chain through focusing on a market niche. This case makes it clear that market strategies are just as important as IP protection. Nonetheless it is fair to say that without patent protection, Arctica could not have succeeded. Despite this success, Mathew Holloway is very critical of patenting regulations. He states that, ‘if you are a small organisation and you try to develop something in a clever and innovative way, and you actually want to do something with it, it can be very difficult. ... It is not really about how good your invention is, it is about how much money you have.’ [19] He refers to multi-national companies who accumulate extensive patent portfolios, which they trade on without ever generating a true interest in exploiting any of their patents themselves. He further points out that ‘A patent is ... only actually valid, once it is tested in court by another company. ... It works as a patent, but only to the point where someone challenges it. And then you have to spend the award money on legal fees.’ [19] Holloway holds the view ‘that the companies who file patents should be charged different amounts depending on what their revenues are, or something along these lines.’ We may conclude, that the chances for a patent to succeed on the market depends on the financial resources available to the IPR holder. This brings back to mind the question, at what point in time a patent ought to be filed, given that start-ups are very restricted in terms of finance. However, Mathew Holloway admits that ‘Without filing a patent we would not have received any funding. Unfortunately it is expected by investors on the whole. Some incubators insist that you spend a certain proportion of your funding on IPR. There is a culture that a patent gives you credibility. It is worth for an early stage company having one as a marketing tool, if nothing else.’ [21] He continues to state that a patent ‘is your only 100% way of protecting your invention if you need to disclose it in some way, as NDAs are worthless.’

4.2. Sea Labs



Figure.5 The Seaboard designed by Sea Labs. The product has been launched in March 2013.

Another venture that was part of the Design London incubator was Sea Labs, founded by Roland Lamb. SEA stands for Sensory, Elastic and Adaptive. The SEA Interface is a novel touch sensory system that can be moulded into various shapes, and enables the seamless transition between discrete and continuous input. It is capable of capturing three-dimensional gestures and gives the user a tactile feedback. Lamb entered the Design London Incubator in early 2011 with his first product, the Seaboard, a radically new musical instrument based on the design of a piano keyboard. The Seaboard’s patent-pending concept enables performers, composers and producers to exert unprecedented real-time control of all the major characteristics of sound. Rather than simply hitting a key with the finger, the pressure can be altered in terms of location and intensity. Thus the pitch can shift seamlessly between notes. Volume and timbre can also be varied. Lamb spearheaded the product development from the start and is now managing director of Sea Labs with around 20 employees. Lamb confirmed that he ‘found it very difficult to bear the costs of early patents.’ [20] Nonetheless he managed to file his first patent within about six months. For Lamb a patent was not only a way to secure exclusive access to the technology, it was also a way to underline the fact that he is fully committed to the project and willing to sustain his commitment long-term. This is thought to have helped to attract the interest of investors and collaborators. Lamb admits that a patent ‘is not always enforceable but this statement of commitment is relevant.’ [20] Unlike other designer-entrepreneurs, Lamb managed to keep all equity to himself during the inception period. The seed funds obtained in conjunction with the Design London incubator scheme allowed him to pay his start-up team instead of shredding equity at the outset. Business partners were carefully chosen, and shares in equity has been reserved for investors. Despite this, Lamb’s employees seem rather content. Good recruitment and people management appear to be alternative options to secure a loyal and dedicated start-up team. Lamb acknowledges having encountered difficulties in finding the right business partners and approach during the initial stages of his business development. But he explains that ‘...through the process I learned a lot about IP, and about product design and about the relationship between IP, product design and entrepreneurship. So those things have all come together.’ [20] This point matches a comment made by IP expert Thomas Hoehn from Imperial College Business School who suggests to ‘take all the tangible assets and look at them all’. [18] Hoehn lists staffing, track records, reputation building and branding developments amongst possible selling points. In other words, there are different ways in which value can be appropriated from a design start-up initiative. Above all other criteria, Hoehn highlights the value of know-how, and emphasises the fact that trade secrets are the most popular tactic in the UK for protecting intellectual property. Confidentiality agreements and secure employment contracts are needed, whilst employees also need to be given incentives to be encouraged to stay with the company.

4.3. Yossarian Lives!

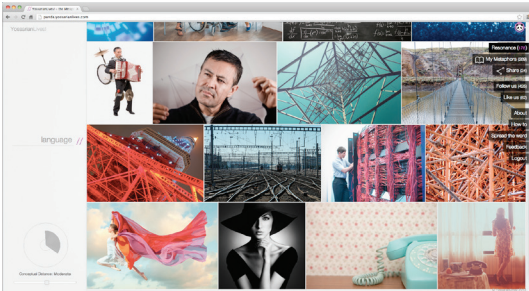


Figure.6 The Yossarian Lives! user interface generated in response to the search term “language”

Yossarian Lives! is a more recent venture and a current member of the InnovationRCA Incubator. It differs from all the others in that it is surrounding a software product. Yossarian Lives! is a metaphorical search engine that uses algorithms to generate results, which are not literally, but metaphorically linked to the search terms. Thus Yossarian Lives! assists users as a creative tool, capable of generating unexpected results, that trigger new thought processes within people's minds. Due to the fact that the product is purely digital, it is impossible to patent in Europe. Instead the inventors, a team of three, J. Paul Neeley, Dan Foster-Smith and Katia Shutova, rely on secrecy in order to sustain exclusivity on the market. Key elements in the programming code are not shared. The search engine, the name of which is a reference to the main character in the novel Catch 22, is currently undergoing its first testing phase. Despite the need for secrecy, the team behind Yossarian Lives! has managed to secure a product development agreement with Getty Images. Through on-going developments, the team is hoping to produce a highly personalised search engines that breaks with the stereotypical functions of conventional search engines. Yossarian Lives! obtained the right to access Getty Images' API (application programming interface) for access to their databases. This allows Yossarian Lives! to return every content from Getty Images' collections, and every image sold through Yossarian Lives! searches generates royalties. Not only did the team manage to set up a setting within which their technology can be put to the test, they also succeeded in initiating a first income stream.

4.4. Cupris



Figure.7 Otoscope by Cupris

Cupris is a venture that started in 2011. Like most start-up teams, this initiative began as a multi-disciplinary collaboration. Paul Thomas has a degree in Engineering and Product Design, his business partner, Julian Hamann is an ENT (ears nose and throat) surgeon. Cupris has been set up for developing mobile diagnostic equipment, software and services designed to involve the patient in the diagnostic process. This is hoped to streamline the delivery of health care at a reduced cost in the UK. The company's launch product is a smartphone-enabled endoscope, that allows for general practitioners to conduct the diagnosis, and to consult with the ENT specialist remotely. Patients are given questionnaires, which help the ENT specialist to analyse the patient's problems over distance. Transferrals to hospitals and specialist doctors are thus made unnecessary. The development team has filed the first patent almost a year prior to entering the incubator. Having a patent application on file has helped

securing a place on the incubator scheme. Due to the fact that the twelve-month post-filing period had not elapsed when the team entered the InnovationRCA Incubator, Cupris could make use of the consultancy service provided through the incubator scheme, in order to decide whether or not to take the patent global, or to extend it through withdrawing and re-filing the patent. It is quite common for start-up ventures to file a patent twice. An early patent application can help to secure seed funding and a place on a business incubation scheme, as it provides the venture with a priority date. Any patent application can be withdrawn and re-filed within the first twelve months. This sets back the priority date to the second filing date. Thus it extends the patent's lifecycle by up to a year and it often helps to include additional details and claims to the patent description. The costs involved in withdrawing and re-filing are patent are usual small. The main risk lies in the fact that another party may file a competing patent prior to the re-filing date, and thus secures priority. However, this risk can be mitigated through a thorough patent search prior to the withdrawal of the first application.

5. Conclusion

Appropriability is term understood as the sum of factors that determine an innovator's ability to capture profits generated by an innovation. As pointed out by Hoehn, Intellectual Property is only one aspect in a range of issues that need to be taken into consideration here, but it is a significant one. Even a patent that is awaiting approval lends credentials to a venture. Secrecy can be seen as an alternative to patenting, and is often preferred as an IP protection strategy, in particular in the US, where companies are known to make "use of first-mover advantages." [5] A patent requires the disclosure of an invention, and "Over the 20-year lifespan of the patent you can expect to pay in excess of £100,000 per invention for reasonable geographic coverage." [1] Nonetheless, for micro-scale start-ups, who need to raise funds and have no company history or brand name to rely on, formal IP is generally the preferred option, in particular if strategic partnerships are needed in order to access the target markets. Formal IP allows for the disclosure of technical details and it underlines the innovator's serious intent. The danger of premature filing is that it cuts the patent's lifespan short, and useful details may remain ignored due to temporary deficiencies in the technology development. The strength of registered IP, as well as its significance for the start-up depends on the territory. Even the term 'start-up' is understood differently in different parts of the world. In the US, where "There is a kind of appetite for risk" [17], you can raise equity investment at a much earlier development stage than in the UK. The conservative investor here will usually want to see formal IP as a confirmation of the inventor's commitment and ability to take a product to market. It is important to highlight that a patent does not only secure exclusivity, but also "freedom to operate". Both protectability and freedom to operate are seen as 'two sides of the same coin ... and basically refer to the degree to which you or others can appropriate value from your potential venture.' [1] Clarysse / Kiefer confirm that 'IP is still central to many business strategies ... if you do possess a solid piece of intellectual property, such as a patent, you're more likely to attract investors for your venture' [1]. A patent helps to increase the sustainability of a venture's value proposition, which is important for a company's growth potential. Even though this may be different for software developers and service design initiatives, it certainly applies to technology-based design initiatives. Filing a patent is often seen as essential to securing angel investment in the UK. An early application can help to secure a place on a business incubation scheme. Provided that such a place is secured in combination with seed funding, a

designer-entrepreneur can utilise the advice obtained from the incubator to improve and re-file the patent application.

Most IP literature does not distinguish between independent start-up companies that are founded by individual designers, or small design teams respectively, and spinouts set up by medium-sized companies and large corporations. However, the question, which IP strategy is most suitable for a start-up company much depends on the company size and the relevant appropriability regime. Government reports seek to cater for businesses of various sizes, and therefore blend the figures obtained from microbusinesses with those gathered from medium sized businesses. This leads to a limited credibility of the recommendations given here. To help aspiring designer-entrepreneurs, individuals and small teams alike, it is important to base recommendations on qualitative data obtained through qualitative bottom-up research. This study will continue to capture the experience of designer-entrepreneurs and start-up teams in order to establish which IP strategies are best suited for the individual designer-entrepreneur, and how the phasing of IP registration, if applicable, is best aligned with other factors surrounding the start-up development. This paper marks the beginning of a five-year study that has been set up to monitor the activities, successes and failures experienced by independent designer-entrepreneurs during the first few years of their business development. It is hoped that this study may encourage and guide future designer-entrepreneurs.

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