

PRODUCT DEVELOPMENT, PUBLIC AND PRIVATE FUNDING ROUTES TO MARKET

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ABSTRACT

The Product Design Engineering (PDE) department at the Glasgow School of Art and the University of Glasgow has witnessed a substantial growth in graduate business start-ups during the last ten years. This paper sets out to explore the contrasts, advantages and disadvantages of support and funding that can be gained from the Private and Public sector. Case studies will demonstrate how one company has been supported through Private funding and support, and another that has received this primarily from the Public sector. Further to this, the paper will also offer the experiences of Product Developer and Public funding Advisor and for recent graduates, the Product Design Engineer in Residence Scheme.

This paper does not set out to cover all aspects of public versus private funding, for example complex issues of tax, R&D benefits are not covered. It is a first attempt to explore the experiences of those in receipt of funding, those responsible in making the decisions.

Keywords: Entrepreneurial, funding, innovation, product development, public, private

1 INTRODUCTION

PDE staff responsible for delivering the programme are considering what they cover in terms of 'entrepreneurial skills' course material and raising awareness of business methods. Including these additional elements to timetables can be extremely difficult, and can result in 'what can we afford to leave out' discussions. The PDE course has attempted to include this growing demand by raising awareness of funding, competition and support opportunities offered by organisations and companies. For example the Scottish Institute of Enterprise (SIE), SMART and Starter for 6 offer support that consists of financial and business advice. Students that are studying a subject that requires them to demonstrate a proof of concept during the early rounds of these projects have an advantage, this is in part down to the fact that they have something to show, a tangible object that can be experienced.

2 SAFEHINGE

2.1 History of Safehinge

The Safehinge door hinge system was initially developed as student project in response to a report published by Mr Doraiswamy, the head surgeon of the A&E department at the Royal Sick Children's Hospital in Glasgow. Mr Doraiswamy's report highlighted the severity and frequency of injuries caused when children trap their fingers in a door and the long term impacts this can have on their development. An international patent application was filed in 2005. As a result, in 2009, Youth Business International nominated the founders, Martin Izod and Philip Ross for Entrepreneurs of the Year. To date, Safehinge Ltd has secured funding from leading organisations including NESTA, Prince's Scottish Youth Business Trust, the highly acclaimed SMART grant and more recently UK Steel Enterprise, a subsidiary of Corus Group.

2.2 The Safehinge Experience

An initial point that was raised by Philip Ross during interview explained that people developing products based in Scotland are very fortunate, especially young people and students due to the level of support available. Philip is now based in the North of England and his recent experience of that area highlights a reduced level of support and appreciation of the resource required to develop products. This is in stark contrast to the early years Safehinge experienced during product development when their operation was solely based in Scotland. The support offered to successful applicants in publically founded projects, for example through SIE did not stop when financial resource was received. The

experience and success of Safehinge has been closely monitored and mentored by account managers at Scottish Enterprise.

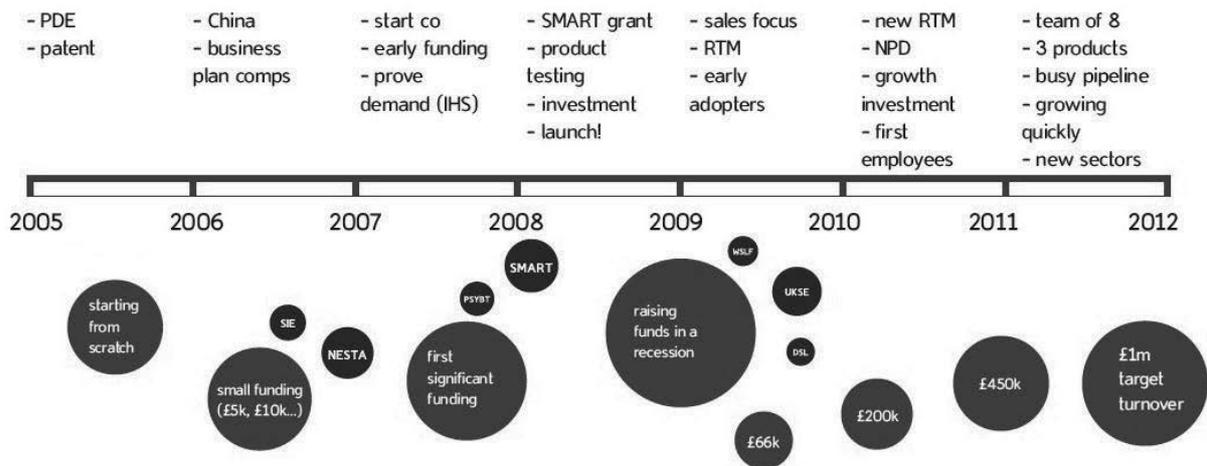


Figure 1. Safehinge Funding Timeline and Experience

The journey embarked upon in the pursuit of refining the product to market was approximately 3 years (see fig1). From the starting point of project, they have also covered the life cycle, finance, production, market research and then routes to market. The next step was securing sales and financing the manufacture. The ratio of the ‘design work’ versus ‘bringing to market’ effort was less than 25% of the total work to date. However, the design work has been a fundamental part, because nothing would have happened without the original design. Philip explained ‘that in terms of our time it hasn’t been enormous, but the design thinking skills and training have been applied throughout the journey’. Safehinge have also experienced differences in what funding bodies appreciate, For example, NESTA are the ‘creative’ focus organisation so they appreciate the added value of design. SIE in contrast, are more market and opportunity led. Martin continues ‘I would say along the different funding or financiers we have been through, all of them look for different things and we have always promoted the aspects of the products or business which best suited that audience. I would say by in large most people have focus on commercial and intellectual property assets/opportunity as opposed to the design side of things.’

2.3 The Commercial Realities

The commercial realities of bringing a product to market have also created additional challenges. Martin is ambivalent about patenting the products. The tangible value that Safehinge see in a patent is ‘When you go to investors, organisations you are trying to raise money or create sales from what it does, you show ownership of a good idea. So I would say it’s a confidence giving tool. Although it is not absolute, but it is better than having nothing.’ In contrast to this, the challenge that Safehinge have experienced is spending 5 years developing specifications, putting this out to tender (most of Safehinge’s business is Public Sector) and rival companies see this, substitute their own product and subsequently undercut, as they don’t have the investment costs that have been incurred by Safehinge. Martin is a supporter of the public investment channels, as they do not have to sacrifice their future financial stability by offering a percentage of the business to private investors. He explains that ‘their risk reward ratio is not based on someone else taking the risk and subsequently owning a percentage of the shareholdings’. The result of this is Safehinge operating as an Enterprise led company and is owned by the by the original founders. Martin’s experience of public funded support is one of a ‘healthy balance’, but he is also acutely aware that companies that receive funding from the private sector tend to reach market sooner. An example of this is Meso Design.

3 MESO DESIGN

3.1 History of Meso Design

The development of Meso as company is in part due to the vision of Steve Mitchell, Managing Director of Teknek (manufacturers of hi-tech cleaning equipment), part of the TH Holding Group (now M2H) a company with over 60 years of manufacturing experience. He approached PDE in 2006

looking for interns. The two students that were employed were subsequently offered part-time work during their final year. This then resulted in a discussion where Danny Kane and Gregor Aikman were provided with an opportunity to create a consultancy under the guidance of Teknek and develop their final year products for market. The product that was selected was a TVClean, a surface contact adhesive cleaner for flat screens.

Founded in 2008, Meso is a multi-skilled and talented product development firm and have quickly established a track record in a variety of sectors from consumer, toys, foods, tools, packaging, industrial and medical products. They originally started with 3 staff, they now employ 9 full time staff.

3.2 The Meso Design experience

Meso's growth and client list has been a polar opposite in comparison to Safehinge (see fig2). We also have to take into account that the Safehinge product and the first Meso product brought to market were originally designed as senior year projects during their time as PDE students.

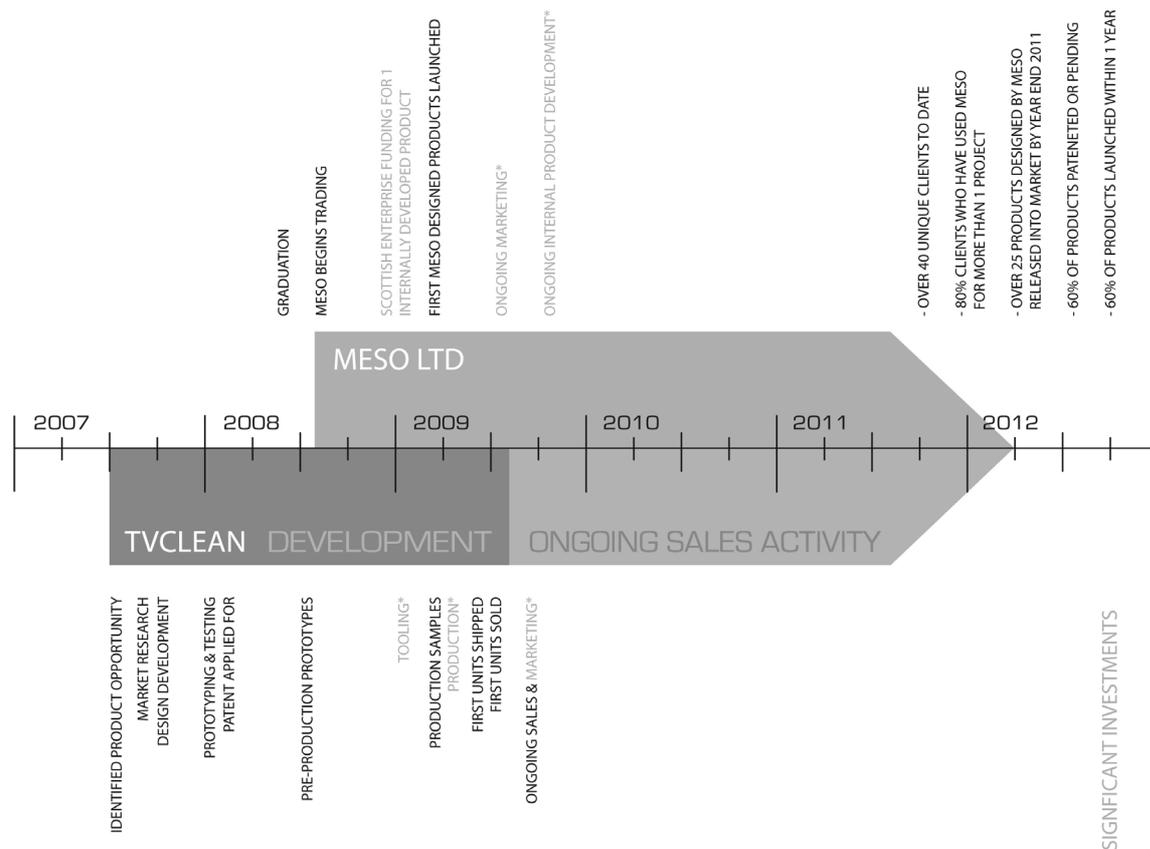


Figure 2. Meso Funding Timeline and Experience

Meso continue to develop their own products, but these fit around the demands of providing services to clients. During the initial years of the Meso, the level of in-house resource hampered the development of in-house products. It was not the cost of developing the products as they could keep the development costs to a minimum due to financial and business support offered by the M2H Holding Group. The risk versus return challenge of developing in-house products was a key factor in decision process. The every day running of Meso was the main driver. They were determined to develop a reputation as an innovative and reliable provider of services to clients, manufacturers and the holding group that have part ownership of Meso.

In contrast to Safehinge, who run the 'business' and out source and locate skills that drive and develop the product, Meso have not out sourced product development work. The scale of in-house product development is based on staff capability and an understanding of potential market success.

The steady increase of Meso staff has enabled them to also consider spin-outs. The team they employ provide a valuable source of opportunities. For example, an electronic engineer may have a product idea that results in another product area for Meso. This business model promotes organic growth.

However, they also look for team members that possess a general awareness and proficiency of product development for their consultancy services.

3.3 The Meso Design Public Funding experience

Meso's experience of funding is not purely through the private sector. They also have experience of public investment through Scottish Enterprise. The experience of completing application forms and creating business plans was not in keeping with their experience of the private sector. In fact, it was considerably different. However, Gregor does appreciate that 'the public network and access to wider range of inputs is an area that we could benefit from'. Danny added to this and highlighted that Meso's network is not as wide ranging as that experienced by Safehinge. This is in part due to the different levels and nature of support provided through public funding. An area that is key to public funded networks are events that raise awareness through the success of product development. A link for Meso with, for example Scottish Enterprise is mutually beneficial to both. Companies that do not have the capabilities to develop complex products for market are seen as high risk for public funding. They may have a fantastic proposition, but no skills to realise the potential. Linking them with companies such as Meso can reduce the risk. Therefore, if they are not part of this network, they may not be aware of the opportunities. Meso are also extremely supportive of providing case studies and compelling examples of business growth and increased manufacturing for the benefit of the Scottish and UK economy.

The Meso experience of private funding support is more 'realistic' and can be less 'structured'. Their experience of private support has a tendency to be more demanding due to the level of stipulations based on return of investment. The public funding requirements of time sheets, monthly reports and account manager meetings became almost a full time job. These administrative duties required Meso to devote valuable time and impacted upon product development. There was a feeling that they were 'going through the motions' as opposed to developing a product for the benefit of the economy.

Meso are acutely aware of the challenges of developing large and complex Research and Development projects. They have experienced this first hand through consultancy. In-house projects of this nature will incur high development costs and require significant funding. The funding may result in a mixture of private and public funding. Meso are keen to point out that there are merits of augmenting private funding with public funding. They also stress that they would not pursue this joint funding approach if there was not a market return and was not of benefit to the economy.

4 THE ADVISOR AND PRODUCT DEVELOPER

4.1 History of Submarine

Submarine, are a design business partnership, they have successfully applied for and benefited from various funding and support packages over a 15 year period, from many funding bodies including the Design Council, ideasmart (Creative Scotland/NESTA), Glasgow City Council, Glasgow Development Agency to facilitate easier and faster routes for product concepts to reach market. Submarine acknowledges that the majority of their designs would not have reached their significant milestones (prototypes, patenting, production) without the assistance of grant funding or awards.

4.2 Aspects of Product Development and Funding

The co-founder of submarine, Jon Barnes, has applied his knowledge of public funding during his position of Product Design Adviser for the Cultural Enterprise Office (CEO Scotland). Jon offers one-to-one product design and business advice services to entrepreneurs and new/small companies looking to further their concepts. Signposting towards funding streams if required or feasible, is one of the many aspects of his role. Jon has also been a member on a number of the assessment panels for the Starter for 6 Programme.

It is Jon's belief that support and funding assistance can dramatically speed up the process of getting products from ideas to proof of concept. This will include prototyping, evaluation and exploration of markets, all essential for small businesses. Without any financial support, products would run the risk of not reaching production and the market. The developer or inventor could also take an unrealistic amount of time to get there. The associated risk is losing market share, or technical developments rendering the original product redundant. Progress is often critically slowed by lack of cash flow at the onset of such a process, when capital is most needed, especially for product development and for companies needing to invest in Intellectual Property - particularly patenting.

Applying for and securing funding/awards, particularly unmatched funding can often seem a protracted, complex and uncertain mission. Criteria and conditions can vary greatly. If assessed by a panel, applications can falter based often on inconsistent judging criteria and differing opinions. There is also the passion and influence of the applicant's pitch. Many otherwise excellent products with possibly strong market potential fail to attract funding at presentation stages based on an applicant's underdeveloped or weak presentation. Business plans, another traditional stumbling block, can appear to be more robust based on over optimistic projections and likewise can suffer from inadequate consideration, for example - pre-production orders.

Jon's experience, which is concurrent with his CEO advisory role, shows that almost all new ventures (particularly in product design) for SMEs, sole traders, entrepreneurs and start-ups looking to develop their products, rely heavily on, or would directly benefit from financial funding. In addition to this, new businesses can be profoundly naïve to the extent of inherent costs, time-scales and the difficulties in overcoming hurdles on the route to market. One of Jon's challenges is explaining that designing a product is the tip of the iceberg when attempting to convert a product into profitable sales. The Fundamental areas that he has to offer advice on are:

- The procedures and costs of securing adequate IP (what type, why, when and where etc)
- The route-ways and difficulties in finding suitable manufacturers with the appropriate capabilities (to produce either prototypes and/or final manufacturing)
- Prototyping – the stages, costs, difficulties, expectations and interpretation of the results
- Evaluating and testing – compliances, standards and quality etc
- Routes to market – promotion, marketing, trade-shows, advertising, branding
- Distribution – orders, stock, suppliers, lead-times, shipping, insurances etc
- Business – costs for everything else... (running a business effectively).

These areas of advice can be addressed to some degree by increased experience, learning and effort. Inadequate financing cannot be addressed this way. 'New business failure rate is sited at its highest (1 in 3) within the first 3 years of trading – all too often as a consequence of: Poor cash flow and/or lack of finance, weak marketing/poor understanding of the marketplace, unclear business objectives, poor management and strategy, lack of motivation and failure to embrace new technologies and developments.' [1].

5 THE CHALLENGES OF FUNDING AND FINANCE

Appropriate marketing (or lack of it) can make or break either a good or a poor product. But without any products (in production), there is usually no business (profit). Therefore, funding packages are usually more preferable to sole traders/small companies than business or financial services based loans. Robert Ford, Managing Director of local produce retailer Tilia believes SMEs should rely on banks for nothing more than an account. He remarks, 'It would be great if the government were proactive in clarifying other forms of finance.'

The Federation of Small Business (FSB) report [2] draws on examples of best practice from foreign banks, such as German and USA, which highlight fundamental weaknesses in the UK banking model. The comparisons show that between 2007 and 2012 there was a 24 per cent fall in the number of successful loan applications for small businesses in the UK compared to a nine per cent decrease in Germany. FSB national chairman John Walker says, 'It is only when you compare bank lending in the UK to the situation in countries like Germany and the USA that you can see the extent to which our banking system fails to deliver what small businesses need Only 4 per cent of firms say they had applied for funding through government initiatives.'

In addition to this, The BDO in their Industry Watch report state that 'Since the 2nd World War we have never had more than two consecutive years of reduction in public spending—we now face six' [3]

6 THE PRODUCT DESIGN ENGINEERS IN RESIDENCE

6.1 The residency

The costs of developing products rise when the concept moves from 2D into 3D (even more so at the physical level). It is unlikely that all start-ups will have access to workshop and prototyping facilities.

In response to this, PDE is also assisting entrepreneurial graduates that are looking to forge their own careers. The Product Design Engineers in Residence Scheme (PDEiR) is a residency position viewed as an opportunity for graduates to develop their product and technical skills in a creative environment.

PDEiR applicants are offered space in the department; they also have access to equipment, prototyping and workshop facilities, free of charge. In return for access, the PDEiR assists with CAD, organise regular talks/seminars by visiting designers and help with site/factory visits for students.

6.2 Associated Challenges

The department is acutely aware that funding assistance schemes, such as Interface, linking Universities and Research Institutes expertise which both small and large companies is encroaching into the territory and business that our graduates are looking to make careers in. This is a challenge that the department responds to by offering design work experience, leading to further awareness and skills, mentored through PDE staff as part of the Product Design Engineer in Residence Scheme. The benefit of this additional experience is not only of value to graduates developing products, but is also a benefit to industry and employers who are offering employment opportunities. Therefore public funding of R&D can contribute directly, by complementing and hence stimulating private R&D[4].

The PDEiR is one area that can be of benefit. However, we only have to look at the new business models of social product development and web based funding platforms companies to appreciate the frustration that product (and other creative industries) are facing when looking to raise funds to develop their ideas. An example of this new approach is Kickstarter; they are currently the world's largest social funding platform for creative projects, they are promoting 'A new form of commerce and patronage. This is not about investment or lending. Project creators keep 100% ownership and control over their work. Instead, they offer products and experiences that are unique to each project. On Kickstarter, a project must reach its funding goal before time runs out or no money changes hands. Why? It protects everyone involved. Creators aren't expected to develop their project without necessary funds, and it allows anyone to test concepts without risk.'[5]

7 CONCLUSIONS AND AREAS FOR FURTHER DISCUSSION

The key difference between Safehinge and Meso is their business model. Safehinge are a Product company that required substantial investment to fund development, manufacturing and production, inventory and route to market. Meso are a Product Consultancy providing a service for clients that require specialist skills to bring a product to market. As noted previously, Meso are also a Product development company, but this is funded through channelling profit accumulated from fees. Meso's set up costs, in comparison to Safehinge where less expensive. Meso benefited from a range of existing skills, including management and manufacturing. This enabled them (as demonstrated in the timelines) to be reach market quicker.

If we consider the fundamental areas covered by Jon Barnes in his role with CEO, it is obvious that an education in Product Development provides an advantage for those that are driven to develop their own products and companies. They have the skills to develop the product, usually the most expensive (other than IP). Areas that these students don't have experience of are the business skills. It is extremely encouraging that organisations such as NESTA and the Scottish Institute for Enterprise are willing to invest in education programmes. They are providing essential knowledge that is of benefit after graduation, but can also be applied to undergraduate studies. However, are educational programmes doing enough to support our students? The conclusion of such, suggests that further discussion and research is required.

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