

ARE DESIGN-LED INNOVATION APPROACHES APPLICABLE TO SMES?

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ABSTRACT

This study analyses the design discourse and approaches in order to identify whether design-led innovation approaches are applicable to SMEs. It discusses the number of concepts that are widely used in design including design-driven innovation, design thinking and user-centred design to identify to what extent these approaches are derived from the findings about SMEs, take SMEs' characteristics into consideration or meet SMEs' specific needs.

To explore SMEs' characteristics and design and innovation, not only literature but also a series of interview conducted with SMEs (n=8) and designers (n=9) were consulted. To reflect design innovation discourse, the core literature on design innovation and a number of audio-visual materials that are publicly available were also analysed.

It has been found that most of the innovation approaches are exemplified through large enterprises and multi-nationals. Findings indicate that several design innovation concepts encourage businesses to understand their users who can provide valuable insights informing the design process. However, SMEs often have close relationships with their customers, and they already integrate these insights to their innovation processes. Note that SMEs do not incorporate such information into idea generation process systematically. Most of the knowledge within the company is tacit. Thus, design innovation should focus on articulation of this knowledge and integrating into the innovation process. A barrier to innovation is SMEs avoid experimenting due to the risks involved. Rapid prototyping emphasised by design thinking provides a low-cost opportunity to explore whether the new ideas will meet the needs and requirements and address some of the uncertainties involved. Since it is cheap and quick, it is relatively a safe way to address the uncertainty of innovation. Therefore, this aspect of design thinking is applicable to SMEs' innovation processes.

Keywords: Design thinking, design driven innovation, innovation, SMEs.

1 INTRODUCTION

Small and medium-sized enterprises (SMEs) represent over 99% of all businesses in the UK and in Europe. Yet, the number of studies on innovation management in SMEs is relatively smaller compared to those on innovation management in large enterprises [1]. Concepts and theories related to innovation are not always valid for small businesses. In the last decades, scholars have highlighted that SMEs and large enterprises innovate differently [1], [2], [3]. Equally, SMEs' design needs and design capabilities are different than large enterprises.

Design innovation has become the focus of many scholars, educators, practitioners, regional governments and design institutions. Design scholars and practitioners encourage a better exploitation of design by taking a strategic approach. Approaches such as design thinking and design strategy which focus on using design as a strategic business tool rather than developing discrete services and products for business have created considerable interest. 'Intuition', 'creativity', 'holistic' and 'lateral thinking' are amongst important business values which supplement and even replace the traditional values of business such as rationality and calculation [4]. Despite the intrinsic appeal of the design approaches, they have been hardly adopted by SMEs. Although the problem is often explained by SMEs' hesitation and their lack of knowledge using design methods, the applicability of design concepts by SMEs has been seldom explored.

The research reported in this paper raises the following questions: (1) Are design models and approaches applicable to SMEs? (2) Are these models developed according to the needs and characteristics of SMEs? To address these questions, the paper analyses the design innovation

discourse and concepts. The data collected for the analysis includes primary and secondary data. The primary data was collected through a series of interviews conducted with SMEs (n=8) and designers (n=9) by using a semi-structured interview schedule during 2012-2013. The SMEs selected for this study were based in Scotland and worked in variety of industrial sectors including oil & gas, food, building, aqua, information technologies, sport and manufacturing. According the EU definition, two SMEs are medium sized enterprises (R1 and R2) and six SMEs (R3 to R8) are small sized enterprises. Designers participated in this study were based in the UK and mainly worked in small sized design consultancies and agencies. The emergent primary data was analysed by adopting a thematic analysis method. The secondary data was gathered by using the existing literature on design innovation, a number of publicly available audio-visual materials to unfold the dominant design-led innovation discourse.

The rest of the paper is structured as follows: the first section introduces some of the design innovation approaches such as design thinking [5], design driven innovation [6], participatory design [7] before moving to presenting SMEs' innovation processes, their characteristics and their capabilities based on the literature and interview findings. Understanding these characteristics serves to evaluate whether design innovation concepts help SMEs to innovate. The design rhetoric section presents how these popular design approaches appear in the design studies and audio-visual materials. Final section concludes the paper.

2 DESIGN INNOVATION APPROACHES

The roadmap to innovation using design is exemplified through different approaches. These include human/user-centred design [8], participatory design [7], design thinking [5], [9] and design-driven innovation [10], [6]. The basic assumption of user-centred design is users can provide valuable insights informing the design process. These insights can be obtained by asking questions to users or preferably by direct observation while they are using the product or the service [11]. Participatory design or co-design, on the other hand, blurs the boundaries between creators and users. Users become a critical stakeholder in the design process. It advocates "power to the people", and considers how we can get greater benefits from new co-designing relationships within a network of participants whose roles have been evolving. Design thinking has also been found to be a promising approach to harnessing innovation capabilities of a company [5], [9], [12]. Brown defines design thinking as a human-centred approach to innovation, "uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity" [5]. Design thinking encourages experimenting and risk taking [5]. "Fail early succeed sooner" is the dictum of many design thinkers. This experimentation process is supported with low fidelity prototyping. Design thinking has raised great interest and mixed reactions amongst design practitioners as well as design scholars [13], [14].

Both participatory design and design thinking have a user focus to achieve innovation. Verganti problematises the user focus in innovation processes and questions how some companies including Alessi, Artemide, Apple or Bang & Olufsen succeed in the market without being user-centred [6]. To him, the reason behind the success of the abovementioned companies is that they apply design-driven innovation. Design-driven innovation stresses the relationship between the vision of the company and new product meanings. Innovation is based on creating new meanings. These new meanings, messages and languages are diffused in society. "Design is the brokering of languages" [6]. His view alters the approach that is design as being solely driven by user needs or new technologies, new functions i.e. 'technology push' and 'market pull' models. Verganti defines design-driven innovation "as an innovation where novelty of message and design language is significant and prevalent compared to novelty of functionality and technology" [15].

3 SMES AND INNOVATION

SMEs play a vital role in both developing and developed countries for economic growth and competitiveness. SMEs' innovation is critical for economy, yet SMEs confront particular problems constraining their innovation activities. Barriers to economic development and innovation are grouped into internal and external barriers [16]. Internal factors are a result of inadequate internal resources and expertise, such as a limited budget for investment, limited access to skilled labour, catching up with improvements in technological advancements, problems in carrying out marketing and project management activities [17]. External factors are market structure, bureaucratic hurdles and the

problem of finding suitable partners to collaborate with [17]. The development of strategies for competition and growth within SMEs are limited especially for the ones that manage their operations on a day-to-day fire-fighting basis [18]. Table 1 summarises the characteristics associated with disadvantage and advantage when they are pursuing innovation and growth. Similar to their larger competitors, SMEs need to be concerned with their market positioning, technological trajectories, competence building and overall organisational processes [19].

Table 1. Summary of SMEs characteristics associated with weaknesses and strengths based on Nooteboom [19]

Characteristics associated with disadvantages	Characteristics associated with advantages
<ul style="list-style-type: none"> • Lack of functional expertise and the difficulty in hiring full-time specialised occupations for diverse tasks • Difficulty of diverting skilled personnel from day-to-day activities • Limited investment capability, resources on new technologies • Lack of organisational characteristics that enable strategic use and acquisition of knowledge • Ad-hoc management • Short-term perspective 	<ul style="list-style-type: none"> • Dynamic–lean structure • Personality, independence • Informal structure, short communication line and strong leadership • Sharing information quickly • Non-hierarchical structure • Accessibility of top level management • Filling niche opportunities • Customised new products

The interviews conducted in this study also reveal the opinions of SMEs regarding their understanding of innovation. The majority of SMEs believe in the potential value of innovation for improving their competitive position, reducing costs and expanding their customer base. Amongst the SMEs interviewed, incremental innovation through smaller improvements are usually preferred to radical innovation steps (R2, R3, R7).

Table 2. SMEs' approach to innovation

Example quotation	Summary statement
<p>“We’ve planned to double our profit in the next 10 years. Large part of that is through innovation, so new products, new product introduction.” R1, SME non-owner-manager</p>	Innovation is important for growth
<p>“You’ve got to be careful that you don’t become too innovative”. R2, SME non-owner-manager</p>	Cautious-avoiding major innovations
<p>“[Innovation is] Obviously doing things differently. But the construction industry is very conservative because it is producing a long-term durable product. If something is tried, tested and proven, we are keen to keep doing that because we know it is safe.” R3, SME owner-manager</p>	Important of tried and tested methods
<p>“Innovation is to me when you come up with a new way of doing something that has obviously got benefits so everybody else is doing so. I don’t think we do that in how we deliver services. It is more small innovations rather than one big ta-da. It is all about lots of small improvement you can make in how we work.” R7, SME owner-manager</p>	Small changes rather than big steps

The main barriers to innovation put forwarded by the SMEs are a lack of time and resources. The small sized businesses were occupied with day-to-day issues, which prevent them to seize innovation opportunities (R3, R5, R6, R7). The interviewees indicate that because of their busy schedules, they do not have time to reflect and plan ahead and instead they focus on short-term results and easy-to-apply solutions.

“I think there are opportunities for innovation that we missed a lot in the past because we are so busy fire fighting and just dealing with day-to-day”. R6, SME non-owner-manager

“Everyone is so busy running around to get the day to day work done, they can’t look forward and plan what they are doing.” R7, SME owner-manager

The majority of the SMEs (R1, R2, R3, R4, R5, R6, R7) approached for this study uses their customers and employees as a source of information and the basis for developing innovation. Often this knowledge is personal and owned by a small number of individuals.

“Simply, I was born and brought up in the countryside, which leads me perhaps to think a bit differently from people who are from the cities. While working in the countryside, we meet a lot of people, listen to them and hear their needs. You pick up what people tell you basically”.

R3, SME owner-manager

“I have been working in the market for 20 years. I understand the market fairly well. Not only I am picking up knowledge on that but also if I have a specific question that needs answering, I can actually ask them directly to the market because I know people and companies within the market. It is done by actually consulting people in the market.” R4, SME owner-manager

Amongst this group of respondents, the representatives of medium sized companies (R1, R2) reported that they develop ideas for innovation on a systematic basis. These initiatives include the use of an idea-box, internally held meetings and workshops held with external or internal facilitators. The other SME respondents from small sized companies (R3, R4, R5, R6, R7) did not mention a systematic process for developing ideas for innovation. Their expertise is often the source of their ideas. It appears that most of the knowledge within these companies is tacit.

On the other hand, from the designers’ perspective, as R16 commented, the focus is on understanding the user, “*They [SMEs] need help, I think they need to understand a lot about their end-users, what their end users need and want. So that’s the big, I think*”. Similarly, as discussed above, several design-led approaches emphasise the importance of understanding users and customers [20]. In fact, communicating directly with customers to understand their needs and opinions is not a problem for small businesses. They often have a face-to-face relationship with their customers. They comprehend the needs and requirements of their customers. However, it appears that small businesses in particular need to capture information from their customers more systematically for generating new ideas for innovation. Therefore, design methods and tools should focus on capturing and articulating the customer’ needs and feedback and then translating this information into the innovation process in a systematic way. The assumption which SMEs do not understand their customers and users may be invalid; thus, user-centredness may not be a ground breaking approach for SMEs.

The interviews conducted in this study indicated that SMEs have a greater tendency to pursue incremental innovations rather than radical innovations. It was clear that SMEs avoid taking risk. Design thinking encourages experimenting and risk taking by proposing ‘fail quickly and cheaply to succeed’. Because uncertainty is an unavoidable part of the innovation process [21], by adapting such aspects of design thinking, SMEs can better address the uncertainties of business and innovation processes.

4 THE DESIGN RHETORIC

Since design innovation has become the focus of many business and design scholars, practitioners and regional governments, there are several online multimedia that promote design innovation and the role of design in business. The Industrial Designers Society of America has recently commissioned Mormedi - a Spanish design consultancy- to produce a video about the main challenges the design industry in Europe. The video presents the viewpoints of leading companies such as BMW, Bosch, Orange, Philips, The Foundry and BBVA. Amongst these different industry sectors such as automotive, consumer electronics, banking or telecommunications, there are no standpoints of SMEs to represent design challenges [22]. Similarly, the UK Design Council’s 2010 video on design’s role in innovation only features big corporate leaders [23].

If the academic design literature focusing on design-driven innovation concepts is explored, it can also be noticed that the concepts draw upon the observations of large enterprises including Apple, 3M and Dyson and build on interviews conducted with designers from leading design-led companies such as Alessi and IDEO. For example, Verganti states,

“Consider for example the diffusion of coloured translucent materials from home furniture to computers (a linguistic exercise that let the Apple I-Mac speak the language of home rather than office. In this case Jonathan Ive, the VP of design of Apple, with previous experience in domestic products, acted as a broker of languages from households to computers)” [6].

Likewise, in his book, he suggests, “Design-Driven Innovation unveils how leaders such as Apple, Nintendo, Alessi, Whole Foods Market build an unbeatable and sustainable competitive advantage through innovations that do not come from the market but that create new markets” [15]. Equally, to Beverland and Farrelly, design-led innovation means that design plays a strategic and central role in innovation. They gave examples from companies such as Apple, Vitra and Dyson [24]. The design process generates innovations that have been unforeseen by the market. Brown provides no mentions to SMEs while introducing design thinking concept [5]. The great emphasis on large enterprises and corporate leaders on these publications poses the question if design innovation concepts are derived from the findings about SMEs. These abovementioned examples still do not fully illustrate how many times we heard of Apple and Dyson when design-led innovations are mentioned. To some extent, using well-known companies to create some sort of recognition is understandable. Nevertheless, these representations also frame the language in such a way that leaves SMEs invisible in the design innovation discourse and leads to questionable assumptions amongst designers.

5 DISCUSSION AND CONCLUSION

This paper has argued that whether design-led innovation approaches are relevant to SMEs’ innovation processes. It looked at SMEs’ core competencies and main barriers to innovation, which were then compared with the features of mainstream design approaches. The findings demonstrate that many SMEs avoid taking risk; therefore, approaches such as design thinking encouraging experimentation, addressing uncertainty and highlighting cheap prototyping are relevant to SMEs and help them build such capabilities. On the other hand, SMEs have close relationships with their customers and users, and they device their customer relationships and observations to generate new innovative ideas. Concepts focusing on understanding users seem to be better suited to large enterprises than SMEs. However, the findings illustrate that most of the knowledge base within SMEs used for innovation and growth is tacit in nature and shared by a small number of people in the company. Design innovation methods therefore should support SMEs to externalise their tacit knowledge.

It has been found that most of the innovation approaches are exemplified through large enterprises. The types of videos, papers and blogs that mainly represent the perspectives of large corporate leaders and multinationals add up over time and affect our understanding of the way in which design should work and help companies. Eventually, this strengthens the invalid assumption that is design-led innovation for large and small firms are alike. These perspectives also have implications for the design education. Design graduates often have to work with SMEs within the current economic climate. This research concluded that viewing SMEs as microcosms of larger companies is not helpful; distinctive characteristics of SMEs should be recognised to understand how SMEs learn, design and innovate. SMEs intrinsic characteristics should be incorporated in the design education, the design theory and the design practice, and the expectations of large enterprises should not dominate the development of the design field.

This research has identified that not all aspects of design innovation approaches are applicable to SMEs. This conclusion matches some of the existing research. For example, Deakins and Freel [18] and Zhang et al. [25] draw attention to the fact that often learning models are developed according to the needs and features of large organisations. Hence, these models are often not applicable to SMEs. For instance, Deakins and Freel claim that considering the size of small firms, theories improving communication can be ineffective in SMEs, as communication with a small number of employees should not be an issue for an SME [18]. To Deakins and Freel, the concepts and theories that recognise the impact of uncertainty in learning and development, such as Schumpeterian dynamic approaches, are better suited for SMEs [18].

While aiming to understand if SMEs’ requirements are addressed by design methods and approaches, it should be noted that SMEs are not only different in size, sector, technology and R&D level, age/lifecycle and geographical location, but also in their individual dynamic and informal knowledge [26]. Over-generalising their inherited weaknesses and strengths might also be problematic while evaluating design approaches for innovation. This research is based on the findings that are derived from the literature and qualitative data derived from a limited number of participants mainly representing Scotland. Future research might consider validating some of the conclusions with quantitative data, such as surveys.

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