

# EFFECTIVENESS OF ECODESIGN METHODS IN ASSISTING SMES TOWARDS MARKET SUCCESS

Munire Hilal BUGALI<sup>1</sup> and Melehat Nil GULARI<sup>2</sup>

<sup>1</sup>Glasgow Caledonian University, School of Engineering and Built Environment

<sup>2</sup>Robert Gordon University, Grays School of Art

## ABSTRACT

This study focuses on how design can help small and medium-sized enterprises (SMEs) achieve sustainability through implementing ecodesign approaches. The literature review on sustainability and ecodesign attempts to reveal key players and concepts in the area, explore the motivations for sustainability practices and the barriers to conduct them. Empirical research, which assembles findings from 10 interviews and an online investigation about 30 companies, explores the successful implementations of ecodesign in SMEs. The findings of this study reveal how design can prove to be an effective tool to achieve sustainability in SMEs through engaging ecodesign methods. It proves that achieving sustainability is not an economic burden; on the contrary, it can create financial opportunities. This study will benefit other companies by establishing a framework to manage the shift towards a sustainability-oriented business approach. Design practitioners can use these examples to communicate the value of sustainability during design education since leadership in ecodesign is essential to assist SMEs' transition into a sustainable business model.

*Keywords: Ecodesign, sustainability, SMEs, profitability*

## 1 INTRODUCTION

Currently, there is an ongoing interest in the area of sustainable small and medium-sized enterprises (SMEs); however, the number of studies about ecodesign activities involving SMEs is not satisfying. This study focuses on the design's role in establishing sustainable business models within SMEs. SMEs comprise 99.9% of the UK industry, account for more than 59.8% of private sector employment and 49.0% of private sector turnover [1]. The fact that businesses have a great influence on society and SMEs make up the largest portion of all businesses in the UK provides a reasonable basis for investigating SMEs in particular.

SMEs are one of the most important shareholders in sustainable development, due to the sheer portion they comprise within the economy. However, SMEs usually have limited resources and budgets to invest in sustainability cause. Governments, policy makers and non-departmental public bodies provide incentives for SMEs so that they can improve their sustainable practices [2]. Nevertheless, the number of enterprises adopting sustainability into their business strategy is still not satisfying, even with the clear benefits of sustainable products/services for business success. The authors believe that the reason behind this is that SMEs are often not aware of the successful models and methods to integrate sustainability into their business strategy, which would help increase profitability and sustain their existence. Therefore, this study chases the sustainable actions, solutions and models that can support SMEs profitability by adopting a business focus, and it looks at the effectiveness of design within that process.

This paper is structured as follows: first, a brief overview of the key concepts involved in this paper is presented in the theoretical background. The concepts around sustainability and ecodesign are discussed, and their relationship is investigated. Barriers and drivers that influence the process of adopting sustainable business models are discussed. In the subsequent section, the methodology of the paper is presented. The fourth section reveals the findings gathered through the empirical research, which focuses on what can be learned from success cases. Motivations of companies in pursuing ecodesign approaches are also investigated. This will illustrate some of the ecodesign methods undertaken in the SMEs, which allow the authors to explicate the differences in comparison to

principles that are discussed in the literature. Analysis of the empirical data reveals how SMEs organise and manage the shift towards a sustainability-oriented business approach. The strengths and weaknesses of companies when applying sustainable solutions in the market are discussed. The final section concludes the paper by providing insights for companies and suggestions for future research.

## **2 THEORETICAL BACKGROUND**

The conception and the application of sustainability have been the subject of much research [3] [4] [5] [6] [7]. Since it is quite a versatile topic, the research in this area took different directions to address the issues involved. In the Sixties, fundamentals of the sustainability concept appeared in terms of environmental concerns, and it was perceived as a single-dimensional issue. Terms like "green economy", "green business" became popular. In the following decades, the social and the economic side of the sustainability were brought forward [8]. The concept of "green economy" eventually evolved into "blue economy" [9] and "circular economy" [10].

The number of sustainability studies emphasising its importance for business, i.e. increasing profitability through sustainability activities, is escalating. [11], [12]. An informed interviewee from the private sector also highlighted the fact that there has been an explosion in sustainability discussions focusing on business benefits in the last two decades. Leaving the pessimistic environmental predictions aside, this business-focused approach proved to increase the attention for sustainability discussions and the number of businesses involved. Neil Carson states in the report of the UK Government's Business Taskforce on Sustainable Consumption and Production [13], "business has got the message: sustainability has strategic implications for future competitiveness and success. And smart businesses are looking to sustainability to help transform products and services and unlock new opportunities for growth and profitability." Nonetheless, sustainability is still being perceived rather complicated, and companies are not fully competent in taking the necessary steps that would transform their operations to perform more sustainably.

### **2.1 Why sustainability is not widely accepted**

Although the extensive number of governmental and voluntary initiatives proves the importance of sustainable development, it still fails to dominate the market. Cohen and Winn [14] claim that there are four important reasons behind this fact. First of all, firms do not bear their share of environmental costs in conjunction with the benefits they receive for granted from the environment, and they externalise these costs negatively (mostly in the form of air and water pollution and soil toxification). Consequently, the society in general suffers from the outcomes rather than the responsible company alone. Secondly, existing pricing mechanisms work imperfectly; the free market economy does not appreciate the true value of natural capital [15]. Many natural resources (such as clean air and water, renewable energy sources, and a regulated climate) are depleted by companies that rarely pay the proper price for these. Another reason is that information is not perfectly distributed: the link between the cause and the effect is mostly obscured, which helps manipulate the customers' choices and make more profit. Businesses that pursue greenwash-based marketing strategies fall into this group. Most people are not aware of the consequences of their consumption habits. In the last few years, a number of products has been developed which would indicate domestic energy and water consumption levels; these products received positive feedback and became successful, in terms of creating awareness and decreasing consumption. Lastly, neoclassical economics assume that companies allocate their resources efficiently; however, this is usually not the case. For instance, the waste generated when making a semiconductor chip amounts to over 100,000 times its weight [15].

### **2.2 Design's role**

Ecodesign, or ecological design, focus on environmental aspects of sustainability and improve the qualities of "products services, hybrids or system changes that minimise negative and maximise positive sustainability impacts" [3] [16]. Vezzoli and Manzini [17] summarised the methods of design in seven headings, namely life cycle design, minimising resource consumption, selecting low impact resources and processes, product lifetime optimisation, extending the lifespan of materials, facilitating disassembly and system design for eco-efficiency. From pollution control to truly sustainable manufacturing, the shift is from doing "less bad" to "more good". Pollution control is necessary, but not sufficient to achieve true sustainable development. Hilton [18] mentions the findings of previous research carried out in Germany, the Netherlands and the USA, which suggested that efforts in

the eco-efficiency and eco-design area could deliver 25 - 50% reduction in pollution and resource consumption per person. As the measures taken get more comprehensive and embrace environmental and social concerns, they also assure economic growth and a sustainable future for businesses and the society.

If we look at the contribution of design to sustain business success, we come across studies that establish the role of design to add value to the product and create economic benefits for companies [19]. Design can improve the quality of products and service systems that are otherwise not human centred, well coordinated and intelligently combined. The rationale of this understanding is based on theories of Austrian economist Carl Menger rather than the free market theory, and he suggests, "Value is thus nothing inherent in goods, no property of them, nor an independent thing existing by itself. It is a judgment economizing men make about the importance of the goods at their disposal for the maintenance of their lives and well-being. Hence value does not exist outside the consciousness of men." [20]

Certainly, changing the way the companies function and reducing their impacts is not the only requirement for the sustainability of the society; the society itself has to adapt to the emerging situation and reconsider the way they live/produce/consume. Schumacher [21] pointed out the need to maintain the society within the nature's carrying capacity, and the debate is still ongoing in this day and age. One thing designers can do is to influence the society by promoting sustainable products and services (sustainable consumption).

Long since the role of design in the economic equation has been interpreted as a desire creator based on aesthetic values. Design took part in consumerism problem by creating a complicated culture of desire. It was mainly reduced to a mass production tool serving Fordist business model and values of industrial society. Unlike in the past, the role of the designer is not limited to merely meeting the needs and stimulating desires to increase non-essential consumption anymore [22], on the contrary, now the designers can and shall work to develop desires for a more sustainable lifestyle [23].

There are also design activists for working for social wellbeing of people in developing countries, almost as redemption for the over-consumption in richer parts of the world [24]. Another role of design is to democratise good quality life by designing affordable solutions. Papanek [25] argues that (industrial) design had destructive effects on the environment through creating new species of permanent garbage and through materials and processes that pollute the air. Some of the designers still feel responsible for these mistakes, even if they did not have a direct contribution to it. It is perhaps this responsibility that they feel motivating them to work for a sustainable future [26].

### **3 METHODOLOGY**

The research followed the mixed method approach and an interpretative paradigm. It assembled the primary data results from the observations and interviews conducted with SMEs, design and business consultancies. Thirty sustainable examples were chosen as success cases. Their sustainability performance was determined on the basis of the awards they received. The data about these companies were gathered from their own websites, interviews and existing case studies. During this selection, the researchers made efforts to choose the examples from a variety of sectors where possible.

To understand the perspective of different stakeholders, ten interviews were conducted with a semi-structured interview schedule over a four month-period in 2012; each interview took 30-60 minutes in duration. Representatives from design-led innovation centres that also give ecodesign support and design consultants from the UK were interviewed about their experiences and strategies in working with SMEs to implement sustainable product/service approaches.

The analysis of data gathered from thirty companies served to build models about how sustainable products/services support growth within the companies. It indicated ways of efficient use of ecodesign for business success.

Seven design methods (life cycle design, minimising resource consumption, selecting low-impact resources & processes, product lifetime optimisation, extending the lifespan of materials, facilitating disassembly, system design for eco-efficiency) to reach sustainability categorised by Vezzoli and Manzini [17] were exploited to examine the design activities carried out by the selected SMEs.

### **4 FINDINGS & DISCUSSION**

This study presents several findings resulting from observations, empirical data and literature review. The main argument of this paper is ecodesign solutions in SMEs is usually preferred only if it creates

an economic advantage for both the company (cost saving, energy efficiency, market differentiation) and the customer (affordable products, intelligent solutions). SMEs that demonstrate a better understanding about ecodesign are likely to have competitive power in the market. It was found that the companies, which started their businesses with sustainable strategies, created a significantly bigger impact with their outcomes. They were able to achieve an entirely sustainable product/service range. On the other hand, adding sustainability to an existing business model often created smaller and slower changes. Both approaches are valuable for the sustainable performance, regardless of their effectiveness.

Economic advantages ecodesign activities bring to the companies are observed either as cost reduction or increased profits. These advantages are achieved by market differentiation, strategic market positioning, meeting regulatory requirements, increasing added value on the products/services, improving customer loyalty and competitiveness.

Figure 1 illustrates the use of ecodesign methods within the thirty sustainable SMEs that were examined. We could see that the most common methods used to pursue sustainability are selecting low impact resources and processes, and system design for eco-efficiency, based on the categorisation established by Vezzoli and Manzini [17]. Selecting low impact resources and processes includes material and process selections which are either non-toxic and harmless to the environment, or renewable and bio-compatible. The recurrence of this method possibly derives from the fact that the material and process innovations are easier to apply in companies' existing business strategies and/or that it is the method most commonly associated with sustainability. The number of companies adopting an energy-efficient approach is also high, mainly because the correlation between economic benefits that the company will gain and the energy efficiency is rather straightforward. Life cycle design and facilitating disassembly methods are rarely stumbled upon in the SMEs investigated. This result from the fact that these methods require advanced know-how and high investment, which SMEs cannot afford easily.

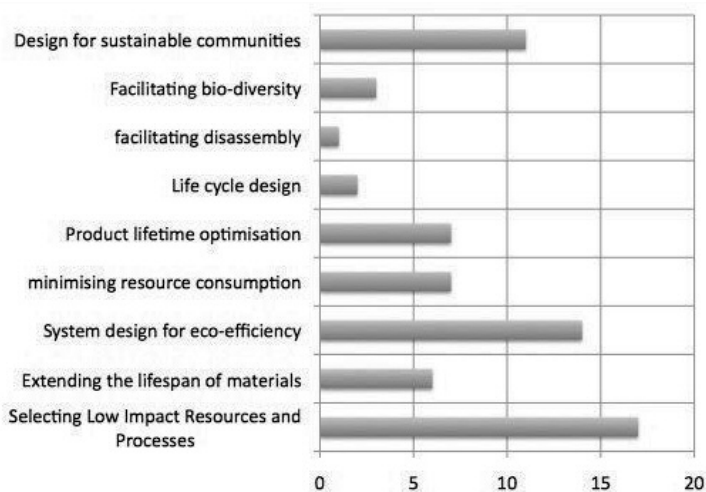


Figure 1. Ecodesign tools used in SMEs investigated

Supply chain pressure was mentioned by the majority of the interviewees as an important driver for SMEs to undertake sustainability, yet the companies investigated did not illustrate aspects of supply chain pressure. The reasons behind this might be that these companies are not suppliers of larger enterprises and/or that they have leadership which embeds sustainability into the core of the business. Supply chain pressure appears when the company do not already include sustainability in its culture and act accordingly.

It is clear that the SMEs examined fall in one of the two groups Verhulst and Boks [27] established: they are either founded with a new business model in which sustainability is a key element, or they integrated sustainability to their existing business model. These companies managed to do this because they were already involved with sustainable materials in their past, and their business did not have to

go through a radical transformation to accommodate sustainable products. However, the companies that start with a completely new model have the opportunity to have their entire product-service range in accordance with sustainability needs as all of their products/services are designed to follow the initial values embedded into their business structure (in respect with environmental, social and economic dimensions of sustainability). This does not necessarily mean that existing companies cannot adapt to changing conditions in the market and become sustainable, but in some cases, it might be just easier to abandon the unsustainable practices in the company's past and rethink the whole structure, rather than trying to modify it.

## 5 CONCLUSION

This study exemplified that ecodesign can help companies to achieve market success. As examined during empirical research, companies can overcome sustainability issues by utilising design and combining its solutions with innovations in different levels (materials, production system, product/service range, etc.). The companies that are fully sustainable should review their structure and investigate possible alternatives to move their operations to a more sustainable level. For example, they might look for different markets, new materials or changes in their production techniques. The more radical changes the companies imply, the more chances they get to maintain and even increase their profitability. Once they embrace changes to become sustainable, they draw economic benefits from improved market positioning and competitiveness, increased added value and customer loyalty, market differentiation and reduced energy and material costs.

This study will benefit other companies by revealing success stories to manage the shift towards an ecodesign-oriented business approach. Design practitioners can use the examples to communicate the value of design in this process more efficiently with different stakeholders, such as policy makers and SMEs. The necessity of sustainability leadership within a company, which was uncovered during empirical research, shows that more designers should get trained with a holistic sustainability focus to be able to provide guidance to the SMEs they are working with.

## REFERENCES

- [1] BIS. Statistical Press Release. Available: [http://webarchive.nationalarchives.gov.uk/20110920151722/http://stats.bis.gov.uk/ed/sme/Stats\\_Press\\_Release\\_2009.pdf](http://webarchive.nationalarchives.gov.uk/20110920151722/http://stats.bis.gov.uk/ed/sme/Stats_Press_Release_2009.pdf) [Accessed on 2013, 23 February] (2010, 13 October).
- [2] BIS. Leadership & Management in the UK - The Key to Sustainable Growth. Available: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/32327/12-923-leadership-management-key-to-sustainable-growth-evidence.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32327/12-923-leadership-management-key-to-sustainable-growth-evidence.pdf) [Accessed on 2013, 21 February] (2012, July).
- [3] Charter, M. and Tischner, U. *Sustainable Solutions: Developing Products and Services for the Future*, 2001 (Greenleaf Publishing, Sheffield).
- [4] Elkington, J. *Cannibals With Forks: Triple Bottom Line of 21st Century Business*, 1997 (Capstone Publishing, Oxford).
- [5] Johansson, G. Success Factors for Integration of Eco Design in Product Development -A Review of State-of-the-Art. *Environmental Management and Health*, 2002, 13(1), pp. 98-107.
- [6] Robèrt, K.H.; Schmidt-Bleek, B.; Aloisi de Lardarel, J.; Basile, G.; Jansen, J.L.; Kuehr, R.; Price Thomas, P.; Suzuki, M.; Hawken, P. and Wackernagel, M. Strategic sustainable development - selection, design and synergies of applied tools. *Journal of Cleaner Production*, 2002, 10(3), pp. 197-214.
- [7] van Halen, C., Vezzoli, C. and Wimmer, R. *Methodology for product service system innovation: how to develop clean, clever and competitive strategies in companies*, 2005 (Uitgeverij Van Gorcum, Assen).
- [8] WCED. *Our Common Future*, 1987 (Oxford University Press, Oxford).
- [9] Pauli, G. A. *The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs*, 2010 (Paradigm Publications).
- [10] Ellen MacArthur Foundation. *Towards the Circular Economy Report vol. 1*. Available: <http://www.ellenmacarthurfoundation.org/business/reports> [Accessed on 2013, 19 February] (2012)
- [11] Kiernan, M. and Martin, J. Wake-Up Call for Fiduciaries: Eco-Efficiency Drives Shareholder Value. *Today's Corporate Investor*, 1998, December, pp. 17-18.

- [12] Dixon, F. Environmental Leaders Achieve Superior Stock Market Performance in the Electric Utility Sector. In *The Annual Public Utility Reporters Environmental Conference*, New Orleans, LA. May, 1999.
- [13] BERR. *Smart Business - Sustainable Solutions for Changing Times; Report of the UK Government's Business Taskforce on Sustainable Consumption and Production*, 2008 (Department for Business, Enterprise and Regulatory Reform, London) p. 3.
- [14] Cohen, B. and Winn, M. I. Market imperfections, opportunity and sustainable entrepreneurship. *Journal of Business Venturing*, 2007, 22(1), pp. 29-49.
- [15] Hawken, P., Lovins, A. and Lovins, L.H. *Natural Capitalism: Creating the Next Industrial Revolution*, 1999 (Little, Brown and Company, New York).
- [16] van der Ryn, S. and Cowan, S. *Ecological Design*, 1996 (Island Press).
- [17] Vezzoli, C. and Manzini, E. *Design for Environmental Sustainability*, 2008 (Springer).
- [18] Hilton, M. *Design for Sustainable Development: Support Systems for Small and Medium-Sized Enterprises*, 2000 (European Foundation for the Improvement of Living and Working Conditions, Dublin) .
- [19] Heskett, J. Creating economic value by design. *International Journal of Design*, 2009, 3(1), pp. 71-84.
- [20] Menger, C. Principles of Economics. Available: <http://mises.org/etexts/menger/principles.asp> [Accessed on 2013, 19 February] (1976)
- [21] Schumacher, E.F. *Small is Beautiful: A Study of Economics As If People Mattered*, 8th reprint, 1978 (Blond & Briggs).
- [22] Cooper, T. Creating an economic infrastructure for sustainable product design. *Journal of Sustainable Product Design*. 1999, January, pp. 7 -17.
- [23] Karlsson, R. and Luttrupp, C. EcoDesign: what's happening? An overview of the subject area of EcoDesign and of the papers in this special issue. *Journal of Cleaner Production*, 2006, 14(15-16), pp. 1291-1298.
- [24] IDEO. Ripple Effect. Available: <http://www.ideo.com/work/ripple-effect-access-to-safe-drinking-water/> [Accessed on 2013, 21 February] (2009).
- [25] Papanek, V. *Design for the Real World: Human Ecology and Social Change*, 2nd ed, 1985 (Thames and Hudson, London).
- [26] Murray, R. "Fordism and Post-Fordism", in Hall, S. And Jacques, M. (ed.) *New Times: Changing Face of Politics in the 1990's*, 1989 (Lawrence and Wishart, London) pp. 38-54.
- [27] Verhulst, E., and Boks, C. "Sustainable Design Strategies in practice and Their Influence on Business Models", in Matsumoto, M., Umeda, Y., Masui, K., and Fukushige, S. (ed.) *Design for Innovative Value Towards a Sustainable Society*, 2012 (Springer, Netherlands) pp. 413-418.