



Intermediaries and innovation support in the design for sustainability field: cases from the Netherlands, Turkey and the United Kingdom



Elif Küçüksayraç^{a, b, *}, Duygu Keskin^b, Han Brezet^b

^a Istanbul Technical University, Faculty of Architecture, Department of Industrial Product Design, Istanbul, Turkey

^b Delft University of Technology, Faculty of Industrial Design Engineering, Design for Sustainability, Delft, Netherlands

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ABSTRACT

Companies face challenges and need support when applying specific knowledge to their innovation processes, such as design for sustainability. The providers of innovation support in innovation systems are intermediaries. While the literature on intermediaries focuses on various roles and approaches, the way in which intermediaries function in specific fields such as design for sustainability remains underexplored. This paper investigates how intermediaries provide innovation support in the design for sustainability field today, with a focus on the services and support they offer, the approaches and drivers that shape them, as well as the challenges of the intermediation process, particularly concerning sustainability and design. To do this, 14 intermediaries from the Netherlands, the United Kingdom and Turkey were investigated through case studies. The role of design in support processes, especially during implementation, the importance and types of collaborations among various actors of innovation systems, and the emergence of a new type of intermediary that promises radical innovation in sustainability are among the findings. In addition, based on the empirical data, we suggest a framework for describing the roles and attributes of a group of five intermediaries that meets the needs of all types of companies engaged in design for sustainability. Finally we offer suggestions for Turkey on how to raise the capacity of its intermediaries operating in the design for sustainability field, which might be applicable to other similar contexts as well. This study contributes to the theory and practice of innovation support in the sustainability field, from which all innovation system's actors, especially intermediaries and governmental institutions, might benefit in designing support programs.

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1. Introduction

Companies face challenges and need support when applying specific knowledge of design for sustainability to complex innovation processes. In innovation systems, intermediaries undertake the task of meeting the needs of companies through innovation support (Howells, 2006). While the literature on intermediaries focuses on various roles and approaches, the way in which intermediaries function in specific fields such as design for sustainability remains underexplored, except for a few examples (e.g., O'Rafferty & O'Connor, 2010; Keskin et al., 2013). Furthermore, intermediaries that solely focus on design for sustainability are scarce.

Turkey's accession process to the European Union is one of the key drivers of sustainable development. Yet, previous studies that compare the knowledge and capabilities of the country's intermediaries with the ones in European countries show that they are limited and need to be developed further (TR-MoEF & TTGV, 2010; Küçüksayraç, 2015). With the aim to learn from advanced examples in the European context, this study investigates intermediaries that operate in the design for sustainability field in the Netherlands and the United Kingdom, as well as the emerging intermediaries in Turkey. It focuses on the services and support the intermediaries offer, their approaches and the drivers that shape them, the challenges they face during the support process and while working on sustainability, and the role of design in the intermediation process. While drawing suggestions for Turkey on how to raise the capacity of intermediaries on design for sustainability, this study's findings aim to contribute to theory and practice by answering the research question 'How do intermediaries provide innovation support in the design for sustainability field today?'

* Corresponding author. Istanbul Technical University, Faculty of Architecture, Department of Industrial Product Design, Istanbul, Turkey.

E-mail addresses: elifks@gmail.com, kucuksayrac@itu.edu.tr (E. Küçüksayraç).

2. Literature review

The literature review focuses on design for sustainability and the role of intermediaries.

2.1. Design for sustainability

Design is defined as 'a creative activity whose aim is to establish the multi-faceted qualities of objects, processes, services and their systems in whole life cycles' (ICSID, 2014). Design has traditionally been utilized in-house within the industry. Later, design consultancy companies emerged, enabling businesses to outsource design (Bruce and Docherty, 1993). By being fast and flexible, the consulting services were especially suitable to the needs of SMEs (Berends et al., 2011). Following the shift from an industrial to a knowledge economy, the expansion of the scope of innovation, and the movement of innovation outputs from tangible products to processes and services, 'design thinking' started to gain importance (Brown, 2008). Design thinking is defined as 'a human centred innovation process that emphasizes observation, collaboration, fast learning, visualisation of ideas, rapid concept prototyping, and concurrent business analysis, ultimately influencing innovation and business strategy' (Lockwood, 2009). Design thinking is proposed as an effective approach to social, environmental and economic problems for being human-centred, creative, iterative and practical (Brown, 2008).

Design has been cited as a source for sustainable development since the 1970s (e.g. Papanek, 1971). 'Ecodesign' the influential design strategy of the 1990s (Brezet and Van Hemel, 1997), evolved into design for sustainability in the 2000s by embracing social and economic concerns instead of just focussing on the environmental ones (Crul et al., 2009). The role of designers in design for sustainability can be either operational or strategic. While operational roles aim at incremental improvements of products, strategic roles aim at exploiting designers' abilities in developing new products and systems (Bakker, 1995). Strategic roles of designers in design for sustainability are akin to the design thinking approach.

Design for sustainability activities differ from general design activities in their environmental assessment, solution-seeking methodology and strategy definition. Moreover, designers' expertise in design for sustainability influences the initial environmental assessment and strategy definition more than the design for sustainability tools (Vallet et al., 2013). Some scholars suggest that a specific expert within the company should be responsible for design for sustainability tools such as life cycle assessment, the strategic evaluation of new concepts and translation of results to the design team (Millet et al., 2007). In addition, customising design for sustainability tools and techniques tailor-made to the company's needs is required in order to better communicate information on design for sustainability within companies. The use of environmental checkpoints, reviews, milestones and roadmaps, and good management commitment and support are also important success factors (Boks, 2006).

The main design for sustainability approaches are, (1) redesign, (2) benchmarking, (3) new product design and (4) product-service-systems design (Crul and Diehl, 2006). While new product development yields to function innovation, product-service-systems design yields to system innovation (Brezet et al., 2001). Recently, design models and methods were developed for combining design and innovation models that aim at achieving sustainable societal change (Gaziulusoy et al., 2013; Joore and Brezet, 2015). Moreover, a large number of tools have been developed for evaluating environmental requirements for products. They vary in complexity, quality and the time required for implementation, while criteria have been developed for selecting the most fitting one(s)

depending on the project at hand (Bovea and Perez-Belis, 2012). Several joint-publications by the United Nations Environment Programme (UNEP) explain the strategies of design for sustainability and their practical applications (e.g. Manzini and Vezzoli, 2002; Crul and Diehl, 2006). In addition, The European Union funded several projects centred around sustainability including 'Ecomind', which aimed at supporting sustainable business growth, by facilitating the development and market penetration of new sustainable products and services (EcoMind, 2009).

A previous study investigated innovation support organizations that were partners in the above-mentioned Ecomind Project by focussing on the innovation processes of eight new ventures and how their sustainability goals are influencing this process (Keskin et al., 2013). Another study investigated the regional dimension of design for sustainability support for SMEs (O'Rafferty & O'Connor, 2010), for which a model was developed following four case studies. The study noted that despite the existence of a number of programmes supporting design for sustainability, its implementation was low, and the studies focused on organisational and methodological barriers in the field.

2.2. Intermediaries

Intermediaries are 'providers of innovation support' (EC, 2009b). They function as brokers between the various parties involved in an innovation system, companies, universities and research institutes, and political arrangements that support innovation (Van Lente et al., 2003). The value of intermediaries lies in their ability to create new possibilities and dynamism within an innovation system, along with improving its connectedness (Howells, 2006).

There are several classifications of intermediary types and functions (Howells, 2006; EC, 2009b). Intermediary types are categorized as (1) innovation and business development agency, (2) university and research centre, (3) chamber of commerce and business association, (4) incubator and science park, (5) cluster organisation, or (6) private consultants. Support instruments of intermediaries are classified as (1) financing, (2) networking and cooperation, (3) awareness raising, (4) internationalisation, (5) technology/knowledge transfer, (6) identification of potentials and needs, (7) innovation management, and (8) creation of specific skills (EC, 2009b).

In addition to intermediaries offering design services, design consultancy companies are cited as intermediaries and 'brokers of technology' (Hargadon and Sutton, 1997). Their source of innovation is defined as tying multiple disconnected industries; yet they not only link ideas and knowledge but also transform them. In the last decade, design innovation gained importance, with many scholars working on elaborating and demonstrating its qualities (e.g. Utterback et al., 2006; Verganti, 2009). Although design attracted little attention from policy-makers before, policies in many countries started to aim at improving design's contribution to innovation (Hobday et al., 2012). Both the 3rd and last edition of the Oslo Manual (OECD/Eurostat, 2005) and reports of the European Commission (EC, 2003, 2009a, 2010) included design as a source of innovation. These developments also require exploring how innovation support for design should be specialized.

Several authors offer classification regarding the approaches of intermediaries. Van Lente et al. (2003) separate intermediaries into 'hard, soft, and systematic', based on the source of innovation they support. Hard intermediaries are traditional intermediaries focusing on engineering and R&D related services. Soft intermediaries focus on management or organizational services. Finally, systemic intermediaries are cited as a new type of intermediary, whose emergence is triggered by complex long-term changes such as

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