RESEARCH PAPER

A typology of strategies for user involvement in innovation processes

Pia Storvang,* Anders Haug and Bang Nguyen

Department of Entrepreneurship and Relationship Management, University of Southern Denmark, Universitetsparken 1, 6000 Kolding, Danmark

ABSTRACT

This paper investigates how an organization can involve users in innovation processes. Based on three case studies and the literature on spaces, user-driven innovations and design management, the paper develops a framework that organizes different types of user involvement strategies. The framework aims to provide a rich understanding of how innovative spaces can be staged under different management strategies. To test the framework, nine SMEs from different Danish industries were selected. The findings show that the framework needs to be flexible in order to accommodate how users can be involved in different contexts and stages of the process. In addition, the study demonstrates various approaches to innovative spaces for involving users and their interests in the company. The framework includes a critique of the one-sided promotion of certain innovation paradigms in the literature. As demonstrated in this paper, different contexts require very different innovation approaches.

Introduction

In recent years, many industries and organizations have focused on how to create more innovation by involving knowledge from such external sources as stakeholders, experts and users (e.g., Chesbrough, 2003; Ivory, 2004; Hafeez *et al.*, 2018; Storvang *et al.*, 2020). Sometimes this involves getting knowledge from authorities, universities, researchers, suppliers, competitors and organizations that offer similar products (e.g., Drew and West, 2002; Ritter and Ford, 2004). In this pursuit of new knowledge, companies will participate in various approaches to interactions such as focus groups, workshops, network activities and other events as part of getting new information (Halse *et al.*, 2010; Storvang *et al.*, 2018). Who is involved in these processes and how they contribute knowledge depends on the purpose, the innovation approach and the context. This suggest that companies should handle the different situations strategically.

Although there has been a focus on user and stakeholder involvement in research, for instance, in governance, healthcare, public service and system design (e.g., Olson and Ives, 1981; Lettl *et al.*, 2006; Halse *et al.*, 2010), this focus has often been on creating guidelines or step-by-step processes, and on the methods used (e.g., Rill, 2016; Akhilesh, 2017; Ramaswamy and Ozcan, 2018), on how to measure user participation (e.g., Barki and Hartwick, 1994; Lettl *et al.*, 2006) or research studies and empirical findings on how they have worked with users in a specific context (e.g., Brandt, 2004; Lüthje and Herstatt, 2004; Halse *et al.*, 2010). Only a few researchers, such as Leonard-Barton (1995), have reported on strategic considerations relating to when to involve users.

*CORRESPONDING AUTHOR: pia@s2rvang.dk

One of the central elements in these processes is the *who* and *how* of involving external sources in different kinds of co-creation processes (Storvang and Clarke, 2014; Roy *et al.*, 2019).

However, previous research has not speculated on how the processes should be organized to create the various approaches to user involvement in different contexts. Furthermore, while some researchers have suggested staging a socio-technical space in the early phases of a development process (Clausen and Yoshinaka, 2007), there is a gap in the literature with regard to the question: What are the contexts that reflect involvement in innovation in different strategic situations that also consider different approaches to involvement in other phases of the innovation process? The current research is inspired by this question. Specifically, the purpose of this paper is to investigate how companies can create frameworks for strategic user involvement in their innovation processes.

Researchers suggest that SMEs across Europe lack awareness of design management and the tools that can support them in integrating co-creation in their everyday processes and behaviors (Thomson and Koskinen, 2012). A central reason for companies not exploring the co-creation path may be perceptions of established organizational hierarchies that have previously been taken for granted. As argued by Child (2011), hierarchies provide people with frameworks to organize their collective work, which can give them a sense of where they belong. In the context of innovation processes, there is a need to be critical of such established hierarchy perceptions.

On the one hand, there is the assumption that producers, marketers and designers always know what is best for users. This logic is nicely illustrated by a famous quote attributed to Henry Ford: 'If I had asked people what they wanted, they would have said faster horses'. The power of such statements can lead to downplaying the potential value of user involvement, (Brandt, 2004; Ivory, 2004; Sanders and Stappers, 2008; Choi and Burnes, 2013). Thus, there is a need to challenge the hegemony of such beliefs with more nuanced perspectives. On the other hand, it is also important not to go overboard in believing that user involvement is the answer to all innovation problems. As noted by Jakob Nielsen, 'users are not designers', and 'designers are not users' (Nielsen, 1993, pp.12–13). Specifically, because users are often not explicitly aware of their needs and wants, rather than directly asking users about these, user-centred design looks to designers to rely on their expertise and methods to figure out what users need and want (Bødker and Nielsen, 2008).

The discussion echoes a common principle of research, namely, to be critical of assumptions. Our argument goes beyond this, but it also involves a critical perspective on the innovation literature, in which authors often promote their own innovation paradigm without putting much effort into exploring its limitations. In this paper, we argue that there is a need to break away from one-sided perspectives on how to carry out innovation processes. This is supported by a framework that includes a typology of different approaches to user involvement in innovation processes. The framework is developed from case studies of three architectural innovation processes and later validated through studies of nine SMEs from different Danish industries.

The paper is structured as follows. First, a brief description of the literature on frameworks for user involvement is provided, followed by a discussion of how the design management and co-creation literature can be used to create a framework as a space for involvement. Then, the three case studies are presented to develop a framework. Next, the nine case studies of SMEs are presented to test this framework. Finally, the paper discusses theoretical contributions, limitations, and future research.

Literature review

User involvement

Different streams of research deal with user involvement, particularly co-creation and open innovation. Co-creation was originally defined by C. K. Prahalad and V. Ramaswamy (2004) as "the

practice of developing systems, products, or services through collaboration with customers, managers, employees, and other company stakeholders" (Ramaswamy and Gouillart, 2010b, p.4). The idea of co-creation is to unleash the creative energy of many people (e.g., Ramaswamy and Gouillart, 2010a, b; Rill, 2016; Rill and Hämäläinen, 2018). Co-creation, therefore, is a creative process that taps into the collective potential of groups to generate insights and innovation. Specifically, it is a process in which teams of diverse stakeholders are actively engaged in a mutually empowering act of collective creativity with experiential and practical outcomes (Rill and Hämäläinen, 2018). This requires a facilitated process of learning that needs to be staged in order to develop relations between the stakeholders in the process (Rill, 2016; Akhilesh, 2017).

The concept of 'open innovation' was introduced by Chesbrough (2003) more than a decade ago and has since gained attention from both researchers and practitioners (Elmquist *et al.*, 2009; Schuurman et al., 2013). Open innovation has been defined as 'the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively' (Chesbrough *et al.*, 2006, p.1). Thus, open innovation builds on the assumption that valuable ideas and knowledge can emerge from internal as well as external sources and can enter the market from inside or outside the firm (Chesbrough *et al.*, 2006). According to Chesbrough (2003), for firms to be able to act on these valuable ideas, they have to open up their innovation approach, because firms that are too internally focused have a tendency to miss out on opportunities that fall outside the firm's current business, or will need to be combined with external technologies to unlock their potential. A question of interest to open innovation researchers is where and how companies open up their innovation processes for external influence and collaboration (Remneland-Wikhamn and Wikhamn, 2011). Companies cannot open up to everything and everyone. They have to make decisions about when to control and when to be more open (Wikhamn, 2013) and with whom they will interact, which means they have to use selective strategies characterized by linking explorative and exploitative knowledge content to specific partners (Bengtsson *et al.*, 2015).

While open innovation and co-creation have many similarities, there are some important differences. From an overall perspective, co-creation may be understood as a bridge between open innovation and user innovation. Specifically, co-creation moves beyond a single-inventor perspective by considering innovation to be a collaborative development of two or more users or stakeholders (Sanders and Stappers, 2008; Schuurman *et al.*, 2013). On the other hand, co-creation is less open than open innovation in the sense that it involves a careful selection of users and stakeholders and definitions of what they should contribute (Schuurman *et al.*, 2013). This is why the co-creation perspective is also the focus of this paper.

Several methods for gaining knowledge are proposed in the user-driven literature (e.g., focus groups, interviews and observations) (Lilien *et al*., 2002). In the design management literature, many authors look at involving users in various co-creation processes (e.g., Brandt, 2004; Sanders and Stappers, 2008; Halse *et al.*, 2010), but often from the viewpoint of a single project or as recipes for a step-by-step process (Liedtka and Ogilvie, 2011) or a process of learning as reflection in action (e.g., Schön, 1991; Brandt, 2004).

Some of these papers emphasize the need to bring a broad range of stakeholders together (Clausen and Yoshinaka, 2007). They argue that ideas are most likely to occur in collaboration between participants in a diversified team (Binder and Brandt, 2008; Gish *et al.*, 2009). Others suggest bringing in specialists, experts, and advanced users only to help in the development of new products or services (e.g., Lilien *et al.*, 2002; Lettl *et al.*, 2006). This lead user method has limitations when what is required is a dialogue between professionals and less qualified users.

In this paper, we consider the users to be not only the end users, but also actors with more limited or indirect use of the developed products and services. Specifically, in many types of development, users should not be seen as including only one group with a particular use pattern, but also a variety of actors related to the client organizations (e.g., Ivory, 2004; Thyssen *et al*., 2010). In the building

industry, for instance, this could include tenants, owners, caretakers, operators, facility managers, service staff, guests and visitors. So, in this sense, some stakeholders can also be regarded as users.

We are in tune with Newcombe (2003), who views stakeholders as multiple actors with different power, investment and interests, and with expectations for the project's performance. Ultimately, in certain types of development projects, it is clear that the people who have something at stake can include a broad range of users and stakeholders, each of whom has individual interests. For instance, in the context of building projects, stakeholders could be architects, structural engineers, builders, interior designers, banks, advisers, suppliers, neighbours and authorities. The project management literature often focuses on the involvement of different stakeholders and particularly on how to manage these stakeholders (Meredith *et al.*, 2016). A range of topics is covered, such as stakeholders' interests, attributes, influence, conflicts, mapping (e.g., Xie *et al.*, 1998; Elias *et al.*, 2002; Bourne and Walker, 2005; Yang *et al.*, 2011), uncertainty and risks (e.g., Chapman and Ward, 2003; Ward and Chapman, 2008), identification, classification and representation (e.g., Crane and Ruebottom, 2012; Aapaoja and Haapasalo, 2014). Literature focusing on how to stage and work with such a process is more sparse.

Innovation processes are not linear; they can have a number of feedback loops and can involve many stakeholders (Storvang and Clarke, 2014). Involvement in their development can change the course of the processes, create uncertainty, and challenge the management of the processes (Ward and Chapman, 2008). The research is also important when choosing methods to create and identify needs and preferences. However, there seems to be limited knowledge on how users can be involved in the process. One way to look at user involvement is displayed in Figure 1, which shows different approaches to user involvement.

As seen in Figure 1, the different approaches to user involvement depend on whether the users are directly or indirectly involved or whether they have acknowledged or unacknowledged needs. It is necessary to identify their needs if they have not been acknowledged. This requires more dialogue to understand users' needs and preferences – or users and professionals may have to acquire knowledge from each other to gain insight into users' needs and preferences. Therefore, involvement can be described as a process of identifying, uncovering, understanding, or developing these different requirements. The differences between user involvement in more and less established companies needs to be considered. Established companies should have more established business processes, organizational culture, product strategies, customer bases and supplier relationships. Thus, it might be expected that more established companies will have more knowledge of the users' acknowledged needs than younger companies.
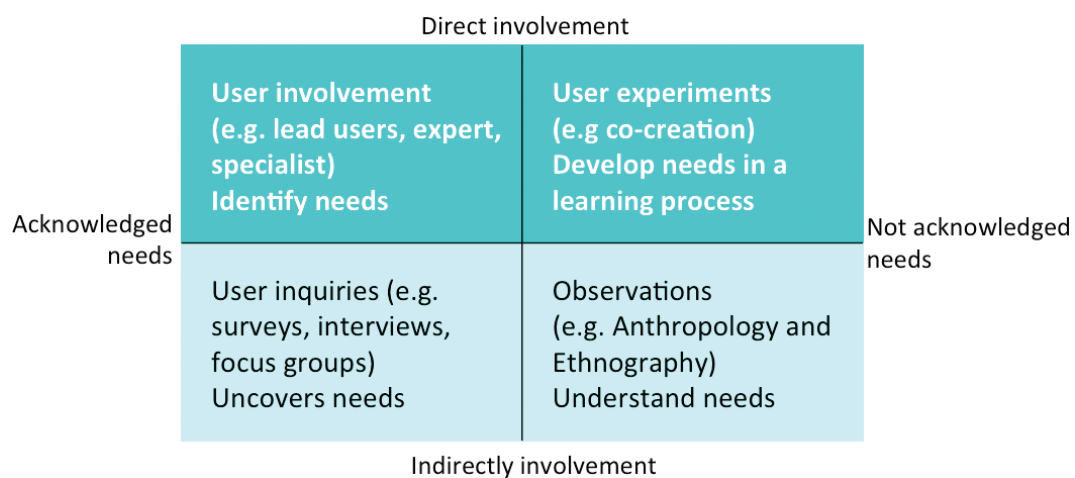

Figure 1. Approaches to user involvement
Source: inspired by Bisgaard and Høgenhaven, 2010

Towards a framework for user involvement

Important contributions to the creation of a framework can be drawn from a participatory design where Binder and Brandt (2008) propose a design lab as a workshop for learning, communication, and creation of innovation with users. This approach involves exploring design opportunities and creating future designs. The laboratory for design is similar to the space discussed in Binder *et al.* (2011) which describes a design space that can move the design agenda from the production of systems and tools to a learning space in which participants can try out possibilities. The space is staged as a shared project and the vehicles for collaboration are props. Different sorts of props and tools support the dialogue and collaboration among the involved participants in the process of co-creation. The fundamental assumption behind the design space is an anthropological approach that does not depend upon a step-by-step process. Rather the method is to experiment, to make participants explore and experiment with various possibilities. This is a space that exists between creative activity and the exchange of information. This is in line with Brodersen *et al.* (2008) who describe the staging of an imaginative place for co-creation between designers and users in participatory prototyping. Since prototyping is a limited part of the process, this definition is too narrow.

An alternative approach is found in Paludan (2010); this is a learning space where professionals can teach others about their business. In some situations, this is of importance when professionals have to teach stakeholders about the business. This is done to raise awareness among stakeholders about what is possible and what they can potentially obtain. The professionals can also learn about the stakeholders at the same time. An approach proposed by Hansen and Byrge (2009) is the creative platform for creative learning. This is a process method designed to enhance creativity and innovation among participants. The results of the process are new and more innovative ideas, and an engaging and creative environment, as well as more creative participants. The process has to be staged in order to get participants in and out of a creative mode and the participants must have as many new creative ideas as possible, which may not always be the best solution in the process of involvement.

Yet another method is the camp model, which focuses on creating ideas and turning them into concepts and rudimentary plans (Bager, 2011). The point of departure is a problem that can be very specific or can be more general. Even though the camp model is about generating ideas, it is still goal oriented. The camp model is a structured process and, in contrast to the creative platform, is a much more closed and structured framework in line with a design thinking process (Liedtka and Ogilvie, 2011) or a design sprint, which is a transformative formula for testing ideas to solve problems within five days (Knapp *et al.*, 2016). So, these processes are much more linear than the creation of a space for innovation.

The creative platform, camp model and the sprint method are relevant when projects require many ideas to find the right solution. However, none of these approaches is clear about who the participants are, how to handle the emergent processes of everyday practice and learning (Binder, 2002) and how the professional and non-professional can learn from each other. Participant-related considerations are included in the model by Clausen and Yoshinaka (2007) on the organization of innovation processes. This argues for a social-technical space. According to Clausen and Yoshinaka (2007), the notion of socio-technical space draws upon design literature (Callon, 1986; Latour, 1987) and is related to social shaping (Sørensen and Williams, 2002). Clausen and Yoshinaka (2007) characterize the process as a variety of actors and aspects that need to be managed in the field of tension that lies between the users/user practices and cultural trends, which is in line with everyday practice.

The aim of the space concept is to clarify for whom the process is formed and how cooperation and communication across different disciplinary boundaries should take place. In this sense, the social-technical space translates the dialogue across boundaries in various organizational, political and knowledge domains with multiple stakeholders and different sources of knowledge. Clausen and Yoshinaka (2007) illustrate this as a generic framework for involvement
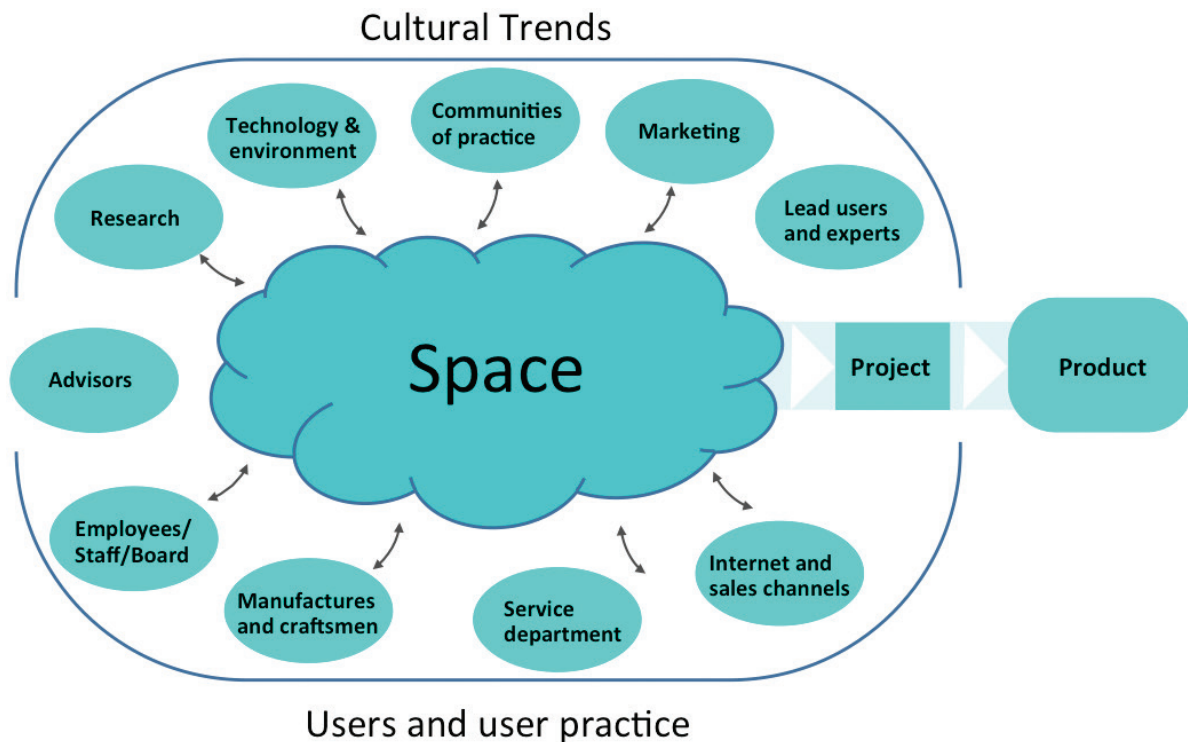
Cultural Trends

Technology & environment

Communities of practice

Marketing

Research

Lead users and experts

Advisors

Space

Project

Product

Employees/ Staff/Board

Manufactures and craftsmen

Service department

Internet and sales channels

Users and user practice

Figure 2. A generic framework for involvement and facilitation of design processes
Source: adapted from Clausen and Yoshinaka (2007)

of stakeholders, particularly in the early stages of design processes (see Figure 2). The basis of this approach is that the stakeholders will meet and contribute their views and knowledge in order to create sense, gain knowledge, generate ideas and form understanding of needs and preferences in the innovation process. The framework can also be used to make decisions about whether different users and stakeholders will participate, which is a strategic consideration. At the same time, this idea of an innovative space is based on a generic situation where stakeholders are involved in group interaction as part of the process, and not so much on who, how and when different users and stakeholders could be part of the process in the field of tension between users and user practices and cultural trends. In other words, users and user practices and cultural trends may be understood as constituting and an overarching framework.

Working with groups

According to Sanoff (2007), research on groups has shown that collective intelligence and insight through interaction are significantly stronger than an individual's opinion. Specifically, collective intelligence is a common understanding that occurs through the process of group interaction, especially when the result is more insightful and powerful than the sum of the individual perspectives. The argument is that individuals are better at producing tacit knowledge as a group (Spinuzzi, 2005). Tacit knowledge often consists of habits and culture that are not necessarily expressed in words or numerical information. It is something that is acquired through individual experience. Tacit knowledge is not easily shared because it is not something of which we are always aware. However, tacit knowledge can be developed through shared learning, social interaction and brain-storming. As a result, each individual's knowledge becomes explicit knowledge in relation to a specific problem (Nonaka and Takeuchi, 1995).

Consequently, the space serves not just to gather people without a purpose or who have the same view. On the contrary, it is crucial to assemble a variety of voices, including new voices, to expand the stakeholder group and allow more views to be heard.

As shown in Figure 2, the process must include a number of different stakeholders and professionals. All relevant stakeholders must be involved because they have different views central to the purpose of the innovation. Clausen and Yoshinaka (2007) refer to this as a social process. The aim is to include multiple sources of knowledge through the involvement of various stakeholders in a social mediating process and the exchange of information during spoken interaction (Luck and McDonnell, 2005): 'participants in design processes must spend time and energy discussing, listening, proposing, and arguing with one another about their respective proposals which will ultimately fix the form of the design' (Bucciarelli, 2005, p.67). The aim is to put all stakeholders on equal terms so they can contribute their knowledge and views. At the same time, it is difficult to get stakeholders to meet on truly equal terms as the knowledge and power base are asymmetric.

A space in which stakeholders can meet allows the facilitator to apply a range of boundary objects to reduce the gap between professionals and non-professionals. Boundary objects, such as drawings, models, prototypes and computer animations, facilitate communication between users and professionals. They help participants understand each other and reduce power differentials so more opinions will be heard (Adams *et al.*, 2009). Circumstances will never be fully democratic. In the meeting between objects and dialogue, it is important that professionals and non-professionals listen and learn from each other (Paludan, 2010). Freeman (1984) argues that a mixture of professionals and non-professionals working together is the ideal context for successful innovation. Learning and negotiation around boundary objects can be seen as creating new meanings that may render a solution within a given economic frame (Meredith *et al.*, 2016).

In investigating how an innovative space for strategic user involvement can be developed as a flexible framework, this paper has been inspired by Clausen and Yoshinaka (2007) and their idea of a space staged through translators of diverse knowledge domains. As with the concept of *ba*, as described by Nonaka and Takeuchi (1995), such a space can be physical, virtual, mental or any combination of these. However, *ba* focuses on knowledge creation while innovative spaces focus on designing processes, products and services. This paper will unfold the flexible framework it describes through case studies that aim to elucidate how the innovative space can be used. However, at the same time, this paper claims that the space suggested by Clausen and Yoshinaka (2007) lacks guidance on how to involve users. Strategies for companies to engage and involve users and stakeholders in innovation processes need to be discussed.

Method

This paper uses explorative case studies (Miles and Huberman, 1994); three cases from the same industry and then nine SME cases from a variety of industries. Using the terminology of Lijphart (1971, pp.691–2), the first three cases can be seen as hypothesis-generating in the sense that a framework is developed based on these, and the subsequent nine cases can be seen as theory-confirming. The first three cases trace user involvement in the building industry between 2008 and 2012. The nine theory-confirming case were selected from a research portfolio of over 50 Danish companies that have worked with design in their innovation processes. The data in the nine cases have been collected to investigate design capacity and how SMEs operate with design and innovation. The data in all 12 cases stem from interviews and observations at workshops and network activities, supplemented with correspondence, official documents, reports, websites and data from other digital platforms. The observations in the workshops and network activities were registered through notes, process maps and photos. These include over 20 workshops and network activities with durations of four to six hours each. The interviews were based on brief interview guides (i.e., semi-structured interviews) and were recorded. Interview data stem from 17 interviews of around

one hour each, analysed through high-level coding of transcripts to identify the most relevant parts and to check for consistency.

The first cases are of three architectural innovation processes. They have been selected to demonstrate ways in which different spaces are used to acquire new ideas, gain knowledge and insight and select solutions for innovation. An architectural innovation process is a complex undertaking (Yang *et al.*, 2011) in that there are many ways to create a building and many ways to involve users. Therefore, construction developers must be able to handle many different approaches to user involvement. Who is involved and the specified requirements of users and stakeholders will influence the final building (Ivory, 2004). This approach can be described as an intensity sampling strategy (Patton, 2015, p.279). The many techniques in architectural innovation processes may be difficult for users and stakeholders to understand, so the framework needs to be flexible to consider who, how and when users should be involved in the innovation. The nine SME cases came from different Danish industries with different approaches to innovation projects. All were involved with the EU-funded programme Design2Innovate, which supports business development and business growth through design and innovation activities (Dansk Design Center, 2019). This approach can be described as a heterogeneity sampling strategy (Patton, 2015), testing the framework in different settings.

Case studies

The three cases of architectural innovation are

1) a project of standard fabricated houses; the users are not known, so there could be many different types of user groups;
2) a project on the development of guesthouses for an existing exhibition and conference centre; this is a project with many users, some of them are already known, but the intention is to attract new user types; and
3) a new extension to an existing single-family house that includes five users already known.

Standard prefabricated houses

In this case, the space can be described as a 'project' space (see Figure 3) because the users were not invited to participate in the development process. The relative importance of the elements around the innovative space obviously depends on the particular context.

The space in this approach is characterized by how others represent the users and their points of view. In this type of project, the innovative part is handled by professionals without much user involvement. However, the users will have some choices before the specific prefabricated house is built. This could be, for example, in terms of the type of kitchen or flooring or roof lights.

Guesthouses

The second case is of guesthouses for an existing exhibition and conference centre. In this case, some of the users are already known to be typical users. The involvement of the users makes this case an 'including' space, where some of the users are invited to a series of workshops in which the professional and non-professional meet to develop the project (see Figure 4). The relative importance of the elements around the innovative space obviously depends on the particular context and stage of the project.

The users work on an equal basis with architects and other consultants to develop ideas, opinions and concept solutions. In this case, they considered what the guesthouses should contain and how guest accommodation should interact with the rest of the exhibition and conference centre.
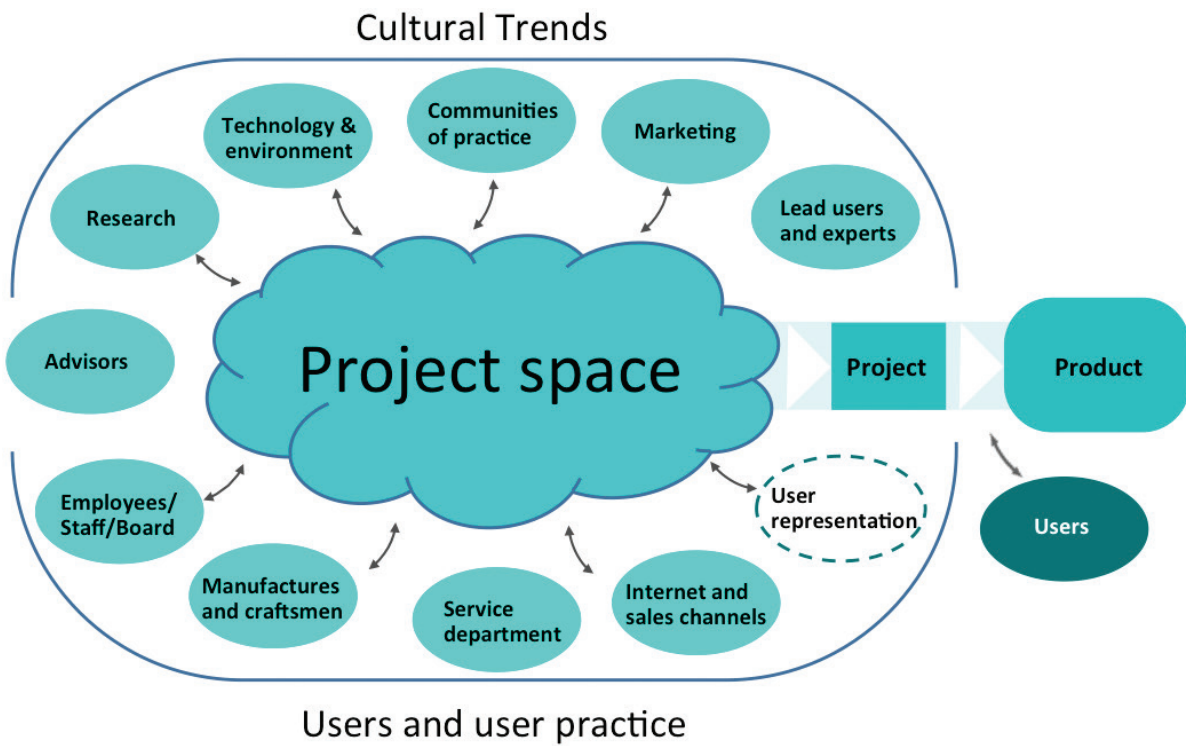
Cultural Trends

Technology &
environment

Communities
of practice

Marketing

Research

Lead users
and experts

Advisors

Project space

Project

Product

User
representation

Users

Employees/
Staff/Board

Manufactures
and craftsmen

Service
department

Internet and
sales channels

Users and user practice

Figure 3. A project space

Cultural Trends

Technology &
environment

Communities
of practice

Marketing

Research

Lead users
and experts

Advisors

Including space

Project

Product

Users

Employees/
Staff/Board

Manufactures
and craftsmen

Service
department

Internet and
sales channels

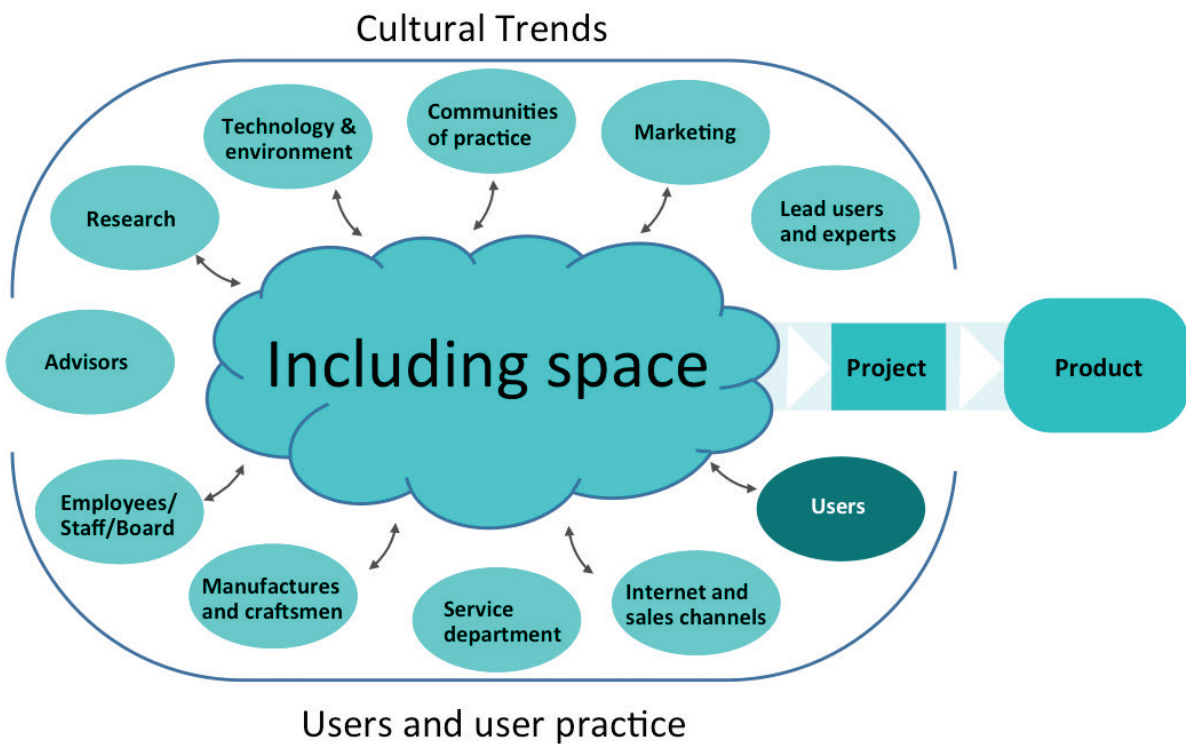## Users and user practice

Figure 4. An including user space

Single-family house

The third case is the development of a new extension to an existing single-family house. The household consists of a mother, father and two children, already known. In this case, it is possible to talk about a 'customized' space (see Figure 5) as the project has been developed and tailor-made specifically for their situation, needs and preferences.

In this specific case, users are central to the whole development process. Everything revolves around their specific needs and requirements. The project has been in continuous development and evaluation from the beginning. Changes to the building occurred because the users' needs changed before the house was finished (partly because the parents acquired another child during construction). This entailed redesigning and changing the layout of the rooms after building had started.

Different approaches to innovative spaces

The three cases are very different in terms of use and who, how and when users are involved in the projects. They illustrate various ways in which professionals work with users. This is illustrated in Table 1, which shows that the three spaces range from virtually no user involvement to a project approach where all decisions are centralized around the users' needs. It seems, then, that the framework suggested by Clausen and Yoshinaka (2007) is not static. The three cases are examples of three different ways to constitute a space for user involvement, interaction and dialogue. Although the innovation is developed around users' needs and preferences, the users are not always asked about their opinion.

Nine SME cases from different industries were selected to test and validate the three approaches. The user spaces in the nine SMEs are described in Table 2. The nine SME cases follow the three approaches outlined in the cases of architectural innovation processes. At the same time, all twelve cases indicate that spaces can be used in various stages of the design, development and
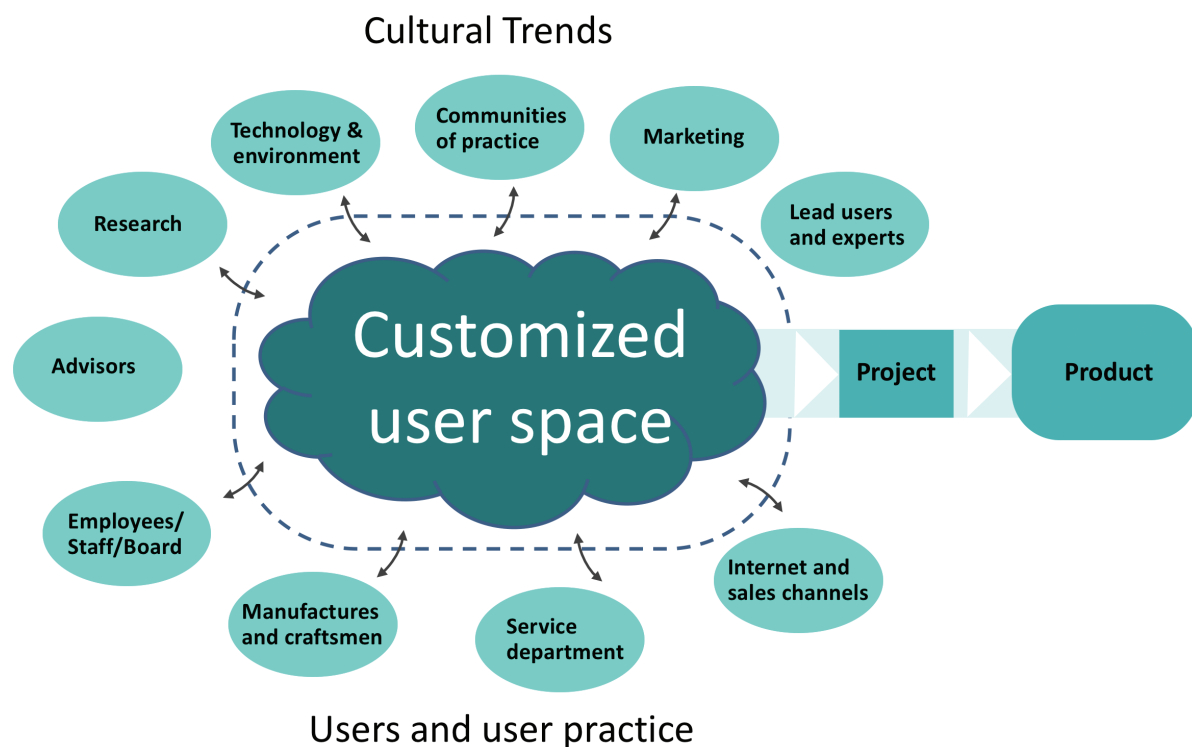

Figure 5. A customized user space

Table 1. Different spaces for user involvement

Innovative spaces with different focus on user involvement		
Project space	**Including space**	**Customized space**
The design of the project is at the centre of the development and the users are not a part of the project.	The users are involved on equal terms with other stakeholders and they are included in the processes.	The development of user needs and values is at the heart of the innovation process. The processes revolve around what the users want.

Table 2. User spaces in nine SMEs

Innovative spaces with a different focus on user involvement		
Project space:	**Including space:**	**Customized space:**
The design of the project is at the centre of the development and the users are not a part of the project.	The users are involved on equal terms with other stakeholders and they are included in the processes.	The development of user needs and values is at the heart of the design. The processes revolve around what users want.
Design-driven manufacturing company of quality woven textiles for home use. The company uses external designers and a professional focus group to represent users to develop its product line. It does not involve customers in its processes, but the professional focus group can be consulted in different phases of the development process.	Design-driven manufacturing company for children's toys for institutions, schools, kindergartens etc. Customers' requirements inspire the company's design of the products. Children are not involved in the design, but client customers give feedback on the prototype to alter the design before production.	Design-driven manufacturing company of customized interior design of vans. The products include specialized finishing and styling. The company works closely with the customer in a co-creation process where the customer is involved in all phases of the design and development process.
Market and supplier-driven retail company selling caravans, outdoor equipment and tents, including a repair workshop. Some unstructured user studies of different user types and shop observations have been made, but the users are not involved in the company's processes.	Market and supplier-driven travel agency for professional group and business travel. The agency sometimes invites customers and sometimes suppliers to various exchange meetings and sometimes they facilitate workshops and network activities to generate ideas with their users.	Technology-driven manufacturing company of air-laid technology for non-woven fibre production. The users are highly specialist B2B customers who are themselves lead users, experts and specialists in the field. The users are involved in all phases of the design, development and testing processes.
Design-driven manufacturing company that produces good craftsmanship and quality furniture. It specializes in comfortable chairs that accommodate individual needs. It sells its products through store retailers. The company has a 'chair bus' for home visits that carries fabric, wood samples and chairs to test, but does not involve users or retailers in their processes.	Technology and supplier-driven company that develops and constructs machines and components in steel, aluminium and stainless steel. Focus on equipment for agriculture, gardening and the transport industry. Main share of production is components and semi-manufactured products that are altered on customers' demand.	Design-driven manufacturing company working with building complexes for industrial machinery and equipment for land-based fish farming. The company develops solutions from single components to complete construction solutions. It involves costumers in the requirement of the complexes to create the best solutions.

construction process; for example, in the initial stages as demonstrated by the kindergarten toy manufacturer, where users are involved in the briefing process. Later in this case, the users were also invited to give feedback on the prototype. Another example is the caravan, tent and outdoor retailer, which relies on unstructured user studies and observations and does not involve users. This is akin to the company producing ergonomic chairs without involving users in their design.

The travel agency and the supplier of components and semi-manufactured products sometimes alter and adjust products in different phases of the requirements, design and development by involving users and their needs and requests. The same goes for the air-laid non-woven fibre production company which involves users in all their processes, as well as the construction of the land-based fish farming company which uses customer involvement in the specification and testing process.

Another example is in the one-family house where the space is used in the initial phases of the project and again throughout the entire process even once the construction has started. Finally, in this case, the spaces are also used in various meetings on site with the various stakeholders such as professional advisers and craftsmen in the construction process, as they are included in different innovative spaces.

It should be noted that it is not argued that any of the three spaces are associated with producing greater innovation than others. Instead, the challenge concerns choosing the best innovative space suitable for a given situation, which is also the one most likely to lead to innovation. Furthermore, a project is not restricted to using just one innovative space. Specifically, the entire process of a project may therefore be seen as a series of innovative spaces throughout the entire project as means to maintain progress in the process as the various solutions in the innovation process emerge. The spaces used can range from spaces with very open processes to more enclosed spaces intended to clarify issues or find specific solutions, which is illustrated in Figure 6 as a series of spaces throughout the process.

Thus, each time a space is set, the aim is clarification of various aspects. But at the same time, the participants must sometimes return to earlier phases in 'loops' and 'feedback-couplings' (Fagerberg *et al.*, 2005), as they are learning what they can create and develop when reconsiderations and shifts are handled in the more unstructured and emergent process as a serious of innovative spaces.

The discussion above gives rise to the question of which situations each of the three spaces should be applied in. The answer to this question may be understood in terms of the relation between 'inclusion value' and 'consensus potential'. Specifically, including users can have value in terms of acquiring new ideas, achieving a better understanding of users and engaging users in the project – while consensus potential has a chance of achieving a satisfactory degree of consensus among users and stakeholders (Brandt, 2004; Sanders and Stappers, 2008; Halse *et al.*, 2010). Overall, the more valuable user inputs are (i.e., learning about users, getting ideas, acquiring knowledge, etc.) and the
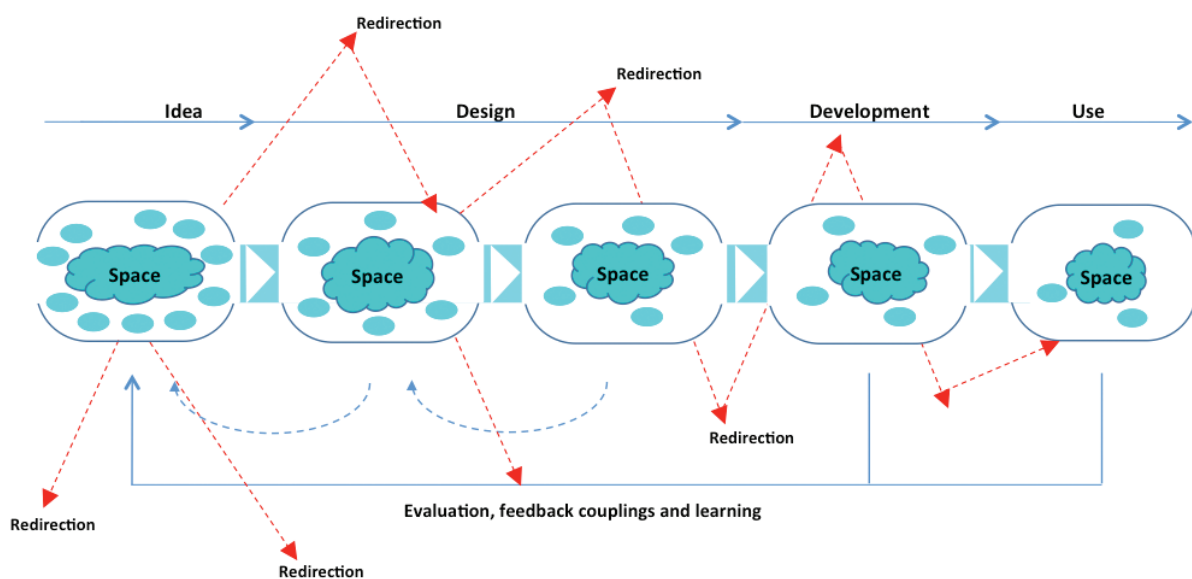

Figure 6. Model for various spaces throughout the innovation process
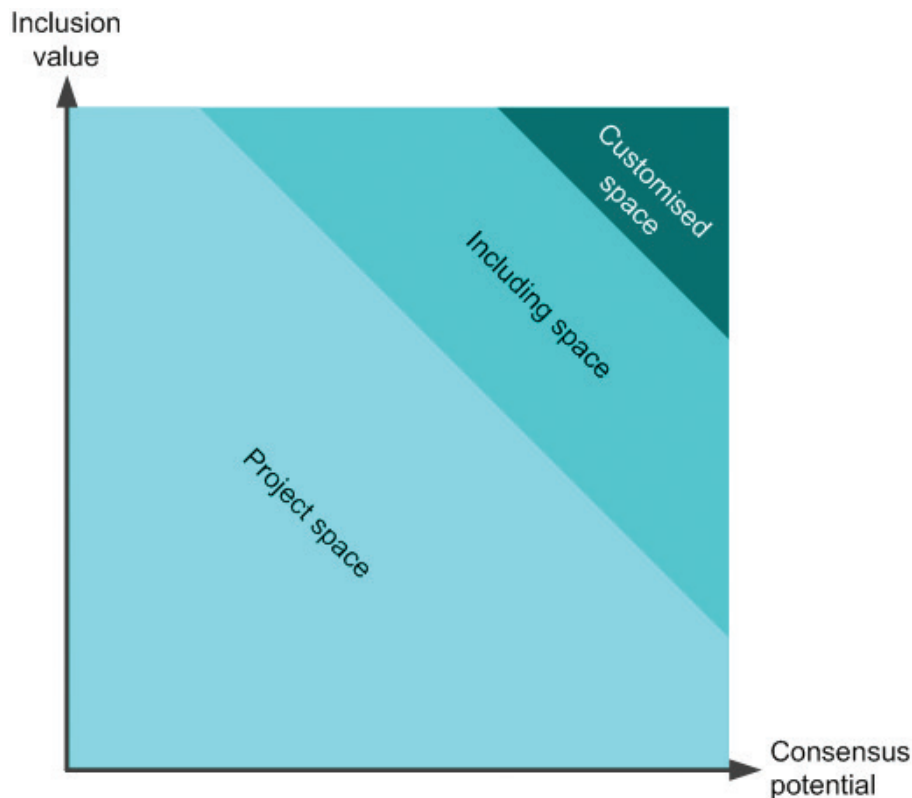
Figure 7. Choice of space

greater the chance of consensus (i.e., a match between the interests of users and stakeholders), the greater the incentive for user involvement. On the other hand, if there is limited value to user inputs (e.g., because users do not know what they want) or a limited chance of consensus (e.g., if users' suggestions and demands go in an undesirable direction for the stakeholders), it would in many cases be better to limit user involvement, i.e., choose the 'project space'. This is illustrated in a principal manner in Figure 7.

Discussion

Research on innovative spaces indicates that the framework developed in this study can be used as a flexible framework for strategic considerations on who, how and when to use user and stakeholder involvement in innovation processes. The three case studies from the development of architecture show that different strategies may be used to show how users can be involved in the innovation process and when it should take place. This finding was validated in the nine SME case studies from different industries.

The three spaces can thus be regarded as different strategies with different approaches to user involvement. The innovative spaces identified are:

(1) *Project space*: The project is at the centre of the development. There is little focus on user involvement and users play only a peripheral role as user observations and professionals' perceptions of users' needs and preferences.

(2) *Including space*: Users are involved on an equal footing with other stakeholders to create learning about the users and the project, or to discuss and develop the project.

(3) *Customized space*: Users' needs and preferences are at the centre of the development of the project and everything that is developed in the project revolves around what the users want.

However, these different types of user involvement can also be seen as various approaches to how users could be involved. The first type is that users are not directly involved in the project and companies must therefore either to seek user information themselves or to rely on professional stakeholders (Akrich, 1995). User perspectives can be obtained through user surveys and observations of the users, depending on whether the users have acknowledged or unacknowledged needs and preferences that they can articulate (Bisgaard and Høgenhaven, 2010). This is evident in the standard prefabricated house case, where users are involved in the project only when they can choose between various options or have extra options that they can choose to buy.

The second type is where users are directly involved in the development of the project. In this approach, users are allowed to express their ideas, needs and preferences with the professionals and other stakeholders, but – again – their ideas, needs and preferences can be known or not known (Bisgaard and Høgenhaven, 2010). Either way, it would be possible in these approaches to include space to involve users in various co-creation processes as they are either experts in what they want, or their needs and preferences have to be developed in a joint learning process with professionals (e.g., Thomson and Koskinen, 2012). In these approaches to the innovative space, users can be integrated into the process. The guest accommodation and the travel agency cases, where users are involved in different workshops, provide examples.

In the third approach, users are considered key experts in what they want to be developed. But here again, their needs and preferences can be acknowledged or unacknowledged, which means that the task of the professional stakeholder is to learn and develop with the users, which means they must decide what methods to employ to gain insight about the users (Bisgaard and Høgenhaven, 2010). This can be seen in the examples of the single-family house, involving non-professional users, and in the air-laid technology for non-woven fibre production, where the company works closely with the users (Storvang *et al.*, 2020). The users here are business-to-business customers who are themselves lead users, experts, and specialists in the field.

Theoretical contributions

The research has shown that no one innovative space is better than another since this depends on strategic considerations and what companies want to achieve from involvement, as well as who, how and when the companies want them to be involved. The suggestion of an innovative space can therefore help companies structure both strategic and management decisions about how the innovative space should be constructed. This gives managers an opportunity to consider who the users are, how to open up the process to different stakeholders and when they should become involved.

The research has also shown that the innovative space does not have to be confined to the early stages of the process (see Clausen and Yoshinaka, 2007). Solutions are constantly negotiated as issues are continuously interpreted, moved and redefined throughout the process.

Companies must make decisions about what is possible to implement, and they must align what is developed in the innovative space to considerations about the brief, design scope, economy and user values (Meredith *et al.*, 2016). However, the innovative space does not indicate how the dialogue should take place and what objects (documents, drawings, prototypes, mock-ups etc.) should be shared with users. Finally, the research has shown that various innovative spaces can occur in different parts of the project, depending on the stage of the project and the aim of the involvement. A dialogue needs to be created for each. Likewise, it is necessary to make strategic and managerial decisions at each stage about which professionals, stakeholders and users should be involved in each innovative space and when. This has interesting implications for managers as they can strategically use this framework as a tool to design innovation.

The proposed framework defines different approaches to user involvement in innovation processes and argues that different parts of a project may include different user involvement in different phases. These assumptions were supported by a set of case studies. A critical stance is taken

towards universal approaches to innovation processes. As argued by Eyal (2019, p.129) in relation to growing scepticism towards experts, 'the attempts to organize, pluralize, mechanize, or out-source expertise are all caught in a self-reinforcing vortex of mutual pollution and mutual undermining'. Specifically, promoting certain perspectives, whether in relation to innovation or other fields of expertise, often involves explicit critiques of other approaches. The collective literature in the research area thereby creates mistrust in any approach other than this, reinforcing the trend of mistrust in experts. It is our hope that the framework, case studies and discussion of this paper will promote a more inclusive stance towards different innovation strategies.

Limitations and future research

The paper's innovative space framework is based on three cases and confirmed by nine other cases. Given that the framework could describe all twelve cases, even though the latter nine were chosen to ensure high variation among cases, the present research offers substantial empirical support for its claims. On the other hand, more studies are needed to understand the potential limitations of the framework. Further investigation with a greater variety of innovative spaces needs to be carried out. It would be interesting to look at the agendas in the various spaces, such as how the spaces use different objects. It would also be interesting to look at how ideas move from one space to another. Finally, it would be interesting to investigate whether other approaches to innovative spaces are to be found.

References

Aapaoja, A. and Haapasalo, H. (2014) 'A framework for stakeholder identification and classification in construction projects', *Open Journal of Business and Management*, 2, pp.43–55.

Adams, R., Mann, L., Jordan, S. and Daly, S. (2009) 'Exploring the boundaries: language roles and structures in cross-disciplinary design teams' in McDonnell, J. and Lloyd, P. (eds) *About: Designing: Analysing Design Meeting*, Taylor & Francis, Boca Raton FL, pp.339–58.

Akhilesh, K. (2017) *Co-creation and Learning: Concepts and Cases*, Springer, New Delhi.

Akrich, M. (1995) 'User representations: practices, methods and sociology' in Rip, A., Misa, T. and Schot, J. (eds), *Managing Technology in Society: The Approach of Constructive Technology Assessment*, Pinter, London, pp.167–84.

Bager, T. (2011) 'The camp model for entrepreneurship teaching', *International Entrepreneurship and Management Journal*, 7, pp.279–96.

Barki, H. and Hartwick, J. (1994) 'Measuring user participation, user involvement, and user attitude', *MIS Quarterly*, 18, 1, pp.59–82.

Bengtsson, L., Lakemond, N., Lazzarotti, V., Manzini, R., Pellegrini, L. and Tell, F. (2015) 'Open to a select few? Matching partners and knowledge content for open innovation performance', *Creativity and Innovation Management*, 24, 1, pp.72–86.

Binder, T. (2002) 'Intent, form and materiality in the design of interaction technology' in Floyd, C. *et al*. (eds) *Social Thinking Software Practice*, MIT Press, Cambridge MA, pp.451–67.

Binder, T. and Brandt, E. (2008) 'The Design:Lab as platform in participatory design research', *CoDesign*, 4, 2, pp.115–29.

Binder, T., Brandt, E., Halse, J., Foverskov, M., Olander, S. and Yndigegn, S. (2011) 'Living the (codesign) lab' in *Proceedings of Nordic Design Research Conference 2011*, Alto University, Helsinki, pp.1–10.

Bisgaard, T. and Høgenhaven, C. (2010) *Creating New Concepts, Products and Services with User Driven Innovation*, Nordic Innovation Centre, Oslo.

Bødker, M. and Nielsen, J. (2008) 'Vision labs: seeing UCD as a relational practice' in *Proceedings of the 20th Annual Australasian Conference on Computer-Human Interaction: Designing for Habitus and Habitat*, ACM Press, New York, pp.283–6.

Bourne, L. and Walker, D. (2005) 'Visualising and mapping stakeholder influence', *Management Decision*, 43, 5, pp.649–60.

Brandt, E. (2004) 'Action research in user-centered product development', *AI and Society*, 18, 2, pp.113–33.

Brodersen, C., Dindler, C. and Iversen, O. (2008) 'Staging imaginative places for participatory prototyping', *CoDesign*, 4, 1, pp.19–30.

Bucciarelli, L. (2005) 'Design collaboration: who's in? who's out?' in Binder, T. and Hellstrôm, M. (eds) *Design Spaces*, EDITA IT Press, Helsinki, pp.64–71.

Callon, M. (1986) 'Some elements in a sociology of translation: domestication of the scallops and fishermen of St Brieuc Bay', in J. Law (ed.) *Power, Action and Belief: A New Sciology of Knowledge?* London: Routledge and Kegan Paul, pp.196–233.

Callon, M. and Law, J. (1989) 'On the construction of sociotechnical networks: content and context revisited' in Hargens, L., Jones, R. and Pickering, A. (eds), *Knowledge and Society: Studies in the Sociology of Science, Past and Present*, JAI Press, Stamford CT, pp.57–83.

Chapman, C. and Ward, S. (2003) *Project Risk Management: Processes, Techniques and Insights*, John Wiley, Chichester, UK.

Chesbrough, H. (2003) *Open Innovation: The New Imperative for Creating and Profiting from Technology*, Harvard Business School Press, Boston.

Chesbrough, H., Vanhaverbeke, W. and West, J. (2006) *Open Innovation: Researching a New Paradigm*, Oxford University Press, Oxford.

Child, J. (2011) 'Challenging hierarchy', in Alvesson, M., Bringman, T. and Willmott, H. (eds) *The Oxford Handbook of Critical Management Studies*, pp.1–15.

Choi, H. and Burnes, B. (2013) 'The internet and value co-creation: the case of the popular music industry', *Prometheus: Critical Studies in Innovation*, 31, 1, pp.35–53.

Clausen, C. and Yoshinaka, Y. (2007) 'Staging socio-technical spaces: translating across boundaries in design', *Journal of Design Research*, 6, 1–2, pp.61–78.

Crane, A. and Ruebottom, T. (2012) 'Stakeholder theory and social identity: rethinking stakeholder identification', *Journal of Business Ethics*, 102, pp.77–87.

Dansk Design Center (2019) *D2I: Design to Innovate*, Copenhagen, available at https://www.d2i.dk/en/ march 2019 (accessed October 2020).

Drew, S. and West, D. (2002) 'Design and competitive advantage: strategies for market acceptance', *Journal of General Management*, 28, 2, pp.58–74.

Elias, A., Cavana, R. and Jackson, L. (2002) 'Stakeholder analysis for R&D project management', *R&D Management*, 32, 4, pp.301–10.

Elmquist, M., Fredberg, T. and Ollila, S. (2009) 'Exploring the field of open innovation', *European Journal of Innovation Management*, 12, pp. 326–45.

Eyal, G. (2019) *The Crisis of Expertise*, Polity Press, Cambridge.

Fagerberg, J., Mowery, D. and Nelson, R. (2005) *The Oxford Handbook of Innovation*, Oxford University Press, Oxford.

Freeman, R. (1984) *Strategic Management: A Stakeholder Approach*, Pitman Publishing, Marshfield MA.

Gish, L., Clausen, C. and Hansen, C. (2009) 'A case study of idea work in the early phases of product development' in *Proceedings of International Conference on Engineering Design*, Stanford University, Stanford CA, pp.447–58.

Gruber, M., De Leon, N., George, G., and Thompson, P. (2015) 'Managing by design', *Academy of Management Journal*, 58, 1, pp.1–7.

Hafeez, K., Alghatas, F., Foroudi, P., Nguyen, B. and Gupta, S. (2018) 'Knowledge sharing by entrepreneurs in a virtual community-of-practice (VCoP)', *Information Technology and People*, 32, 2, pp.405–29.

Halse, J., Brandt, E., Clark, B. and Binder, T. (2010) *Rehearsing the Future*, Danish Design School Press, Copenhagen.

Hansen, S. and Byrge, C. (2009) 'The creative platform: a new paradigm for teaching creativity', *Problems of Education in the 21st Century*, 18, pp.33–50.

Ivory, C. (2004) 'Client, user and architect interactions in construction: implications for analysing innovative outcomes from user-producer interactions in projects', *Technology Analysis and Strategic Management*, 16, 4, pp.495–508.

Knapp, J., Kowitz, B. and Zeratsky J. (2016) *Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days*, Simon & Schuster, New York.

Latour, B. (1987) *Science in Action: How to Follow Scientists and Engineers through Society*, Harvard University Press, Cambridge MA.

Leonard-Barton, D. (1995) *Wellsprings of Knowledge: Building and Sustaining the Source of Innovation*, Harvard Business School Press, Boston.

Lettl, C., Herstatt, C. and Gemuenden, H. (2006) 'Learning from users for radical innovation', *International Journal of Technology Management*, 33, 1, pp.25–45.

Liedtka, J. and Ogilvie, T. (2011) *Designing for Growth: A Design Thinking Toolkit for Managers*, Columbia University Press, New York.

Lijphart, A. (1971) 'Comparative politics and the comparative method', *American Political Science Review*, 65, 3, pp.682–93.

Lilien, G., Morrison, P., Searls, K., Sonnack, M. and von Hippel, E. (2002) 'Performance assessment of the lead-user idea generation process for new product development', *Management Science*, 48, 8, pp.1042–59.

Luck, R., and McDonnell, J. (2005) 'Architect and use interaction: the spoken representation of form and functional meaning in early design conversation'. *Design Studies*, 27, pp.141–166.

Lüthje, C. and Herstatt, C. (2004) 'The lead user method: an outline of empirical findings and issues for future research', *R&D Management*, 34, 5, pp. 553–68.

Meredith, J., Mantel, S. and Shafer, S. (2016) *Project Management: A Managerial Approach*, John Wiley & Sons, Hoboken NJ.

Miles, M. and Huberman, A. (1994) *Qualitative Data Analysis: An Expanded Sourcebook*, Sage, Thousand Oaks CA.

Newcombe, R. (2003) 'From client to project stakeholder: a stakeholder mapping approach', *Construction Management and Economics*, 21, 8, pp.841–8.

Nielsen, J. (1993) *Usability Engineering*, Morgan Kaufmann, San Francisco.

Nonaka, I. and Takeuchi, H. (1995) *The Knowledge-Creating Company*, Oxford University Press, Oxford.

Olson, M. and Ives, B. (1981) 'User involvement in system design: an empirical test of alternative approaches', *Information and Management*, 4, 4, pp.183–95.

Paludan, T. (2010) 'Creating spaces of learning', in Halse, J., Brandt, E., Clark, B. and Binder, T. (eds) *Rehearsing the Future*, Danish Design School Press, Copenhagen, pp.170–7.

Patton, M. (2015) *Qualitative Research and Evaluation Methods: Integrating Theory and Practice*, Sage, Thousand Oaks CA.

Prahalad, C. and Ramaswamy, V. (2004) *The Future of Competition: Co-creating Unique Value with Customers*, Harvard Business School Press, Boston.

Ramaswamy, V. and Gouillart, F. (2010a) 'Building the co-creative enterprise', *Harvard Business Review*, 88, 10, pp.100–9.

Ramaswamy, V. and Gouillart, F. (2010b) *The Power of Co-Creation: Build it with Them to Boost Growth, Productivity, and Profits*, Simon & Schuster, London.

Ramaswamy, V. and Ozcan, K. (2018) 'What is co-creation? An interactional creation framework and its implications for value creation', *Journal of Business Research*, 84, 2, pp.196–205.

Remneland-Wikhamn, B. and Wikhamn, W. (2011) 'Open innovation climate measure: the introduction of a validated scale', *Creativity and Innovation Management*, 20, 4, pp.284–95.

Rill, B. (2016) 'Resonant co-creation as an approach to strategic innovation', *Journal of Organizational Change Management*, 29, 7, pp.1135–52.

Rill, B. and Hämäläinen, M. (2018) *The Art of Co-Creation: A Guidebook for Practitioners*, Springer, Berlin.

Ritter, T. and Ford, D. (2004) 'Interactions between suppliers and customers in business markets' in Håkansson, H., Harrison, D. and Waluszewski, A. (eds) *Rethinking Marketing: Developing a New Understanding of Markets*, John Wiley & Sons, Chichester, UK, pp.99–116.

Roy, S., Singh, G., Hope, M., Nguyen, B., and Harrigan, P. (2019) 'The rise of smart consumers: role of smart servicescape and smart consumer experience co-creation', *Journal of Marketing Management*, 35, 15/16, pp.1480–1513.

Sanders, E. and Stappers, P. (2008) 'Co-creation and the new landscapes of design', *CoDesign*, 4, 1, pp.5–18.

Sanoff, H. (2007) 'Editorial: Special issue on participatory design', *Design Studies*, 28, 3, pp.213–15.

Schuurman, D., De Marez, L. and Ballon, P. (2013) 'Open innovation processes in living lab innovation systems: insights from the LeYLab', *Technology Innovation Management Review*, 3, pp.1128–36.

Schön, D. (1991) *The Reflective Practitioner: How Professionals Think in Action*, Ashgate, London.

Spinuzzi, C. (2005) 'The methodology of participatory design', *Technical Communication*, 52, 2, pp.2163–74.

Starbuck, W. and Nystrom, P. (1981) 'Why the world needs organisational design', *Journal of General Management*, 6, 3, pp.3–17.

Storvang, P. and Clarke, A. (2014) 'How to create a space for stakeholders' involvement in construction', *Construction Management and Economics*, 32, 12, pp.121166–82.

Storvang, P., Mortensen, B. and Clarke, A. (2018) 'Using workshops in business research: a framework to diagnose, plan, facilitate and analyze workshops' in Freytag, P. and Young, L. (eds) *Collaborative Research Design: Working with Business for Meaningful Findings*, Springer, Berlin, pp.155–74.

Storvang, P., Haug, A., and Nguyen, B. (2020) 'Stimulating consumer community creation through a co-design approach', *International Journal of Market Research*, 62, 2, pp.2176–94.

Sørensen, K.H. and Williams, R. (eds) (2002) *Shaping Technology, Guiding Policy: Concepts, Spaces and Tools*. Cheltenham: Edward Elgar.

Thomson, M. and Koskinen, T. (2012) *Design for Growth and Prosperity*, European Design Leadership Board, Helsinki.

Thyssen, M., Emmitt, S., Bonke, S. and Kirk-Christoffersen, A. (2010) 'Facilitating client value creation in the conceptual design phase of construction projects: a workshop approach', *Architectural Engineering and Design Management*, 6, 1, pp.118–30.

Ward, S. and Chapman, C. (2008) 'Stakeholder uncertainty management in projects', *Construction Management and Economics*, 26, 6, pp.6563–77.

Wikhamn, B. (2013) 'Two different perspectives on open innovation: libre versus control', *Creativity and Innovation Management*, 22, 4, pp.4375–85.

Xie, J., Song, X. and Stringfellow, A. (1998) 'Interfunctional conflict, conflict resolution styles, and new product success: a four-culture comparison', *Management Science*, 44, 12, pp.12192–206.

Yang, J. and Shen, G., Ho, C. and Xue, X. (2011) 'Stakeholder management in construction: an empirical study to address research gaps in previous studies', *International Journey of Project Management*, 29, 7, pp.900–10.