

Facilitating co-creation in living labs: The JOSEPHS study

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Developing innovative services is vital for economic growth and competitiveness of firms. In order to realize service innovation, companies increasingly reach outside the boundaries of their own organisation. In this manner, they are involving larger parts of their value chain in the innovation activities and turning towards the users for inspiration. To engage with customers in the co-creation process to understand both existing and emerging user needs, the use of living labs has emerged as a new way to build competences, and sustain competitive advantage. Living labs allow for the creation, validation, and testing of new services, business ideas, markets, as well as technologies in real-life environments.

However, empirical investigation about co-creation enablers in living labs is scarce. To fill this gap, this paper analyses factors that facilitate co-creation in living labs. The study integrates findings derived from existing literature with primary data collected at a living lab called JOSEPHS as well as with companies using it. Six critical factors to facilitate co-creation in living labs are identified and discussed. This study offers first insights into the operational activities and design structures which are implemented to facilitate co-creation in living labs. In particular, living labs and companies gain deeper understandings of the factors that are relevant to consider when engaging in co-creation.

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Facilitating co-creation in living labs: The JOSEPHS study

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Living labs offer a new open innovation platform for companies to engage customers in co-creation and to understand user needs. However, empirical investigation about co-creation enablers in living labs is scarce. To fill this gap, this paper analyses factors that facilitate co-creation in living labs. The study integrates findings derived from existing literature with primary data collected at a living lab called JOSEPHS as well as with companies using it. Six critical factors to facilitate co-creation in living labs are identified and discussed.

Introduction

Organisations are increasingly using open innovation to reach beyond their own boundaries, enhance internal innovation and expand their markets. Living labs provide a new platform for companies to engage customers in a process of co-creation (Lusch et al., 2007) and to understand both existing and emerging user needs (Westerlund & Leminen, 2011). Living labs are *“a user-centric innovation milieu built on every-day practice and research, with an approach that facilitates user influence in open and distributed innovation processes engaging all relevant partners in real-life contexts, aiming to create sustainable values”* (Bergvall-Kåreborn et al., 2009, p.3). Considering this definition it is evident that living labs have the potential to enable businesses, authorities, researchers, and customers to collaborate for the creation, validation, and testing of new services, business ideas, markets, as well as technologies in real-life environments (Bergvall-Kåreborn, et al., 2009).

In order to develop new products and services that better meet consumers' wants and needs, it is however crucial to identify elements that facilitate co-creation in living labs. While existing literature offers conceptual discussions about co-creation in living labs, empirical investigation about its enablers is scarce, particularly with respect to services. To advance the understanding of co-creation in living labs, the objective of this paper is to analyse factors that are critical to the facilitation of co-creation in living labs. To achieve this objective, the study integrates findings derived from existing literature with primary data collected with JOSEPHS' managers and researchers as well as companies that have utilized the living lab.

Following the introduction, section two describes the approach to the systematic literature review and discusses the theoretical background relevant to the understanding of co-creation. The third section outlines the research design. Together with findings from the existing literature, results from the primary data collection are presented in section four. Finally, section five concludes the study discussing contributions to academic research and practice.

Systematic Literature Review

A systematic approach to review existing literature on co-creation in living labs has been employed due to its objective, transparent and unbiased approach (Tranfield et al., 2003). Systematic reviews, indeed, deliver the most efficient, as well as high-quality, method for identifying and assessing extensive literatures (Mulrow, 1994). A search with a broad range of keywords, terms and strings related to value co-creation, living labs and services research across six databases was performed. According to the number, quality and focus of articles reviewed by title, Scopus was identified as the most relevant scholarly database for this research topic. Keyword pairs were used to specify the literature of interest and to ensure that relevant studies are included and no study is excluded without thorough evaluation (Meline, 2006). Furthermore to ensure all relevant articles were captured in the literature review, a single keyword search was also performed. Finally, snowball sampling was employed in order to include other influential contributions not already captured in the systematic review. Based on defined inclusion and exclusion criteria, the search strategy described identified 278 academic papers. These are used to analyse concepts that are associated with elements facilitating co-creation.

Co-creation Elements

A first evidence from the analysis of the literature is the relevance of concepts such as involvement (Nambisan & Baron, 2007), integration (Baron & Harris, 2008), and participation (Aarikka-Stenroos & Jaakkola, 2012). In order to facilitate co-creation, it is indeed vital that customers engage in behaviours beyond those of a buyer or a user only. An approach that investigates customer activity beyond interactions with a provider is called customer engagement behaviour (CEB). One of the most essential elements affecting CEB includes attitudinal factors. These encompass, but are not limited to, trust (de Matos & Rossi 2008), customer satisfaction (Anderson & Mittal 2000; Palmatier et al. 2006), customer goals, resources, value perceptions (van Doorn et al., 2010), brand commitment (Garbarino and Johnson 1999), brand attachment (Schau et al., 2009), and brand performance perceptions (Mittal et al., 1999).

The value literature has predominantly put emphasis on firm conditions needed for successful value co-creation, stressing strong relationships (Jaworski & Kohli 2006; Prahalad & Ramaswamy 2004), high quality interactions (Payne et al., 2008) and dialogue (Auh et al. 2007). CEB focuses instead on the resources contributed by customers: Jaakkola and Alexander (2014) remark how a firm's willingness to integrate customer resources into offering development affects the joint value co-creation process. The same scholars, also identify mobilizing behaviour, defined as customers utilizing resources to mobilize other stakeholders' actions towards the focal firm, as another co-creation enabling element. Jaakkola and Alexander (2014) suggest that mobilizing behavior offers the prospect of generating value co-creation opportunities beyond existing relationships accessing new customer and stakeholder relationships.

According to Lazarus et al. (2014), the type of service determines the level of interaction and the greater the level of interaction between firm and consumers, the greater is the extent of co-creation. Besides the type of service and brand; the extent of co-creation is also influenced by firms' willingness to co-create and consumers' willingness to co-create.

Nevertheless, co-creation needs to be understood and assessed with respect to the social context in which it occurs (Edvardsson et al., 2011). According to Edvardsson et al. (2011), value itself must be considered as part of the collective social context as different customers may perceive the same service in a different way, and the same customer might regard the service differently between occasions in a different social context. The framework suggested by Payne et al. (2008) outlines contextual elements that are likely to have an influence on the level of effort a customer decides to invest on service co-creation. Specifically building on Normann's (2001) research, Payne et al. (2008) identify two sets of aspects: customers' own capabilities, skills, and motivation and the operant resources that the customers can access to accomplish those goals. On the provider's side, two aspects are vital to facilitating the exchange—the quality of its employees and the perceived quality of its facilities. Moreover, Aggarwal and Basu (2014) suggest that the amount of effort exerted by a customer in the co-creation of value is positively influenced by the personal goal clarity that the individual has with respect to service outcomes. Moreover, the amount of effort exerted is positively affected by the perceived relevance of the service in achieving desired service outcomes. Thereby, the service provider contributes two resources to the service encounter: service facilities and service employees. Existing literature highlights that both aspects are critically important for service outcomes (Aggarwal & Basu, 2014). Similarly, Rust and Oliver (1994) recognise these two elements as the service environment and the customer–employee interaction. Personnel can play a significant role in facilitating customer effort. They can help customers understand their role in value co-creation and support them by directing their exertions into more productive use of their time and effort. In the context of services, not the exchange, but the interaction between service providers' employees and the customers propel value (Bailey et al., 2001).

Table 1 – Co-creation elements from existing literature

Co-creation Element	References
Attitudinal factors	Van Doorn et al., 2010
Consumer's/firm's willingness to co-create	Lazarus et al., 2014
Social context	Edvardsson et al., 2011
Perceived relevance of the service	Aggarwal & Basu, 2014
Personal goal clarity	Aggarwal & Basu, 2014
Customer capabilities, skills and motivation	Payne et al., 2008
Mobilizing behaviour	Jaakkola & Alexander, 2014
Type of service/product	Lazarus et al., 2014
Participation	Aarikka-Stenroos & Jaakkola, 2012
Dialogue	Auh et al., 2007
Strong relationships	Jaworski & Kohli, 2006
Integration/involvement	Baron & Harris, 2008
Interaction	Payne et al., 2008
Expected benefits	Füller, 2010
Quality of employee interactions	Aggarwal & Basu, 2014
Firm's willingness to integrate customer resources	Jaakkola & Alexander, 2014
Access to operant resources	Payne et al., 2008
Service facilities	Aggarwal & Basu, 2014

Yet to encourage customers to contribute their creative ideas, honestly share their product preferences, and devote substantial amounts of time altering existing product concepts, their expectations have to be met (Füller, 2010). They only offer their time and talent if they

consider co-creation to be rewarding. Empirical studies conducted in online settings show that customers are motivated to engage in non-transactional behaviors because they expect benefits such as enhanced knowledge and reputation, social benefits, and economic benefits (Füller 2010; Nambisan and Baron 2009). A consolidated view of the elements facilitating co-creation derived from the systematic literature review is offered in Table 1.

Empirical Research Design

To gain an in-depth understanding of co-creation practices and the factors that facilitate co-creation in living labs, a single case study at the living lab JOSEPHS® - the service manufactory is conducted. The case study approach was chosen to explore the rather new phenomenon, co-creation in living labs, in-depth (Yin, 2014). Through an open approach, a deep understanding of processes (Swanborn, 2010; Symon & Casell, 1999) will be enabled as well as the assessment of real-life experiences in their context (Miles et al., 2013; Flick, 2014). The case JOSEPHS is chosen due to its set-up as a continuous platform for interactive innovation with volunteers on one hand and its openness and approachability on the other. The results from the case study will be integrated with the main concepts emerging from the literature review to provide an integrative framework about the enablers of co-creation in living labs.

The Case

The subject of the case study, JOSEPHS, is a living laboratory for new service development and testing with real users. The project is initiated by the Fraunhofer Center for Applied Research for Supply Chain Services (SCS) in cooperation with the Chair of Information Systems at Friedrich-Alexander-University Erlangen-Nuremberg. The project is funded by the Bavarian Ministry for Economic Affairs and Media, Energy and Technology. Established in May 2014 in Nürnberg town centre, JOSEPHS attracts co-creators through its living lab which is an open space that is divided into five co-creation spaces each occupied by a company for three months under one theme. Apart from the actual living lab, JOSEPHS also offers three additional areas: think tank, shop, and café.

Data Collection and Analysis

The data collection for this case is based on three full day focus groups with a) the team behind JOSEPHS and b) companies that have utilized JOSEPHS for their innovation activities in the past two years. The data collection, as presented in Table 2, was carried out between November 2014 and March 2016. A team of trained researchers was involved in the conduction of focus groups, interviews and observations, enabled by a number of formal and informal visits to the site, telephone calls and workshops. The focus groups were recorded and transcribed, and integrated with notes from the focus groups and research protocols. Each of the workshops were analysed individually, and summarized according to the perspective of the customer or company. Then, the findings from the systematic literature review and the findings from the primary data collection were synthesized.

Table 2 – Data Collection

Method	Approach	Purpose
Pilot-Study	<ul style="list-style-type: none"> • Interviews with JOSEPHS team • Observations • Analysis of secondary data 	Understanding of JOSEPHS as a project idea and collect background information about business model, historical background and current issues.
Facilitators perspective	<ul style="list-style-type: none"> • 2 focus groups with the team of JOSEPHS & team of researchers • Complimentary interviews • Observations 	Understanding factors, mechanisms and characteristics for co-creation. Validation of findings from the first focus group.
Companies' perspective	<ul style="list-style-type: none"> • Focus group with 3 companies • Interviews • Secondary data analysis • Paper-based survey 	Evaluation of perceived co-creation processes in JOSEPHS; development of elements for the co-creation template and discussion.

Findings and Discussion

Results coming from focus groups, interviews and observations were triangulated with the results from the systematic literature review to provide an integrative list of factors facilitating co-creation. The findings point out 54 co-creation elements which were grouped in six critical factors. They are: Customer Engagement, Relationship Management, Atmosphere, Operating Principle, Design Layout, and Data Collection Approach. These can be viewed in Table 3.

1. Customer engagement is defined as *“the level of a customer’s physical, cognitive, and emotional presence in their relationship with a service organisation”* (Patterson et al. (2006, cited in Broedie et al., 2011, p. 256). Engaged customers play a central role in the development of new services and products, particularly in co-creating experience and value (Hoyer, et al 2010; Kothandaraman and Wilson 2001; Nambisan and Nambisan 2008; Brakus et al., 2009; Prahalad and Ramaswamy 2004). The findings from the systematic literature review shows eight elements that influence customer engagement. These include attitudinal factors (Van Doorn et al., 2010), the firm’s as well as customer’s willingness to co-create (Lazarus et al., 2014), the social context (Edvardsson et al., 2011), the perceived relevance of the service (Aggarwal and Basu, 2014), personal goal clarity (Aggarwal and Basu, 2014), customer capabilities, skills and motivation (Payne et al., 2008), mobilizing behaviour (Jaakkola and Alexander, 2014), and the type of service or product (Lazarus et al., 2014) involved in the process.
2. Relationship management refers to *“the process of managing the relationships between an organization and its internal and external publics”* (Oluseye et al., 2014, p. 53). Six concepts emerged through the systematic literature review and are associated with this factor: involvement (Nambisan & Baron, 2007), integration (Baron & Harris, 2008), dialogue (Auh et al., 2007), interaction (Payne et al., 2008) strong relationships (Jaworski and Kohli, 2006), and participation (Aarikka-Stenroos and Jaakkola, 2012). Customers’ expected benefits are another crucial element in this category (Füller, 2010). To these elements, more can be added from the analysis of the relationship between JOSEPHS and the customers, and JOSEPHS and the companies that utilize the living lab. As part of the JOSEPHS-customer relationship, a tailored approach from JOSEPHS’ staff to guide the customers is needed – for example in accordance to their level of knowledge. The management of customer expectations is also a prerequisite for delivering superior service from JOSEPHS and from the companies’ point of view. This is vital as living labs allow companies to present products and services at an early

development stage which may have errors; furthermore although JOSEPHS put emphasis on the fun and interactive part of the co-creation process, it is very important to convey the seriousness of customer contributions and to maximise feedback opportunities. Well-trained and enthusiastic guides are essential to JOSEPHS and as a consequence HRM related activities, such as recruitment, training motivation and internal communication play a pivotal role.

As well as managing customer expectations, although for different reasons, firm expectations have to be managed too. This is important because a living lab differs from ordinary market research and allows to derive in-depth understanding of customer perceptions that may reside outside the usual target groups but does not necessarily produce large amounts of data. Furthermore, a tailored project template drawing on experience from previous case studies is an element that supports firms in managing the co-creation process more effectively. Networking opportunities, sharing of best practices and encouraging communication via an online tool among companies that have been at JOSEPHS at different points in time are also all elements facilitating effective co-creation. These would allow for more transparency, accessibility of knowledge and learning. Moreover, providing company background information to customers is vital for them in order to make informed judgments in the co-creation process. Jaakkola and Alexander (2014) argue indeed that customers supply a broad variety of resources to co-creation which influence the firm and the customers in different levels of magnitude and impact (cf. Van Doorn et al. 2010). Consequently, a firm's willingness to integrate customer resources into offering development affects the joint value co-creation process between the firm and its customers (Jaakkola & Alexander, 2014).

3. Atmosphere is of paramount importance in co-creation. This study found that both, firms and living lab facilitators, put emphasis on the importance of the atmosphere at JOSEPHS. The guidance provided by the living lab facilitator should be proactive and enthusiastic, however maintaining a neutral position is and ensuring the independence to the companies. Thereby, facilitators should give customer room for action, interaction but also discontinuation in the co-creation process. Also, creating a comfortable atmosphere in workshops is key to derive honest answers and insights from customers. Aligned with this goal, it is important to prevent embarrassing situations for the customer. Despite the important role this element "atmosphere" plays in co-creation, the literature does not report it.
4. The operating principle of JOSEPHS, defined as the concept and values that outline how the living lab operates, also represents a critical factor in facilitating co-creation. JOSEPHS operating principle has to cater for the needs of different firms including B2C and B2B. Another key element of JOSEPHS' operating principle is the establishment of themes which change every three months, allowing customers to co-create across different business islands under one theme. Based on continuous customer feedback throughout the period of three months and an iterative feedback process to the company, immediate adjustments can be achieved. Furthermore, JOSEPHS acting as a consultant, coach or service provider by assisting the company in the co-creation process more in-depth displays another key element of the operating principle facilitating co-creation.
5. To facilitate the co-creation process in a broader context, it is critical to consider the living lab's design layout. However, literature vaguely discusses this factor and only focuses on access to operant resources (Payne et al., 2008) and service facilities (Aggarwal & Basu, 2014). The case of JOSEPHS shows that intuitive, playful elements that incorporate a familiar behaviour are helpful in order to maximise the opportunity to receive feedback. This research also found that it should be taken into account that trying out products as well as services and giving feedback may require customers to use their hands. Thus, a 'hands-free approach' should be employed, providing enough shelf space for items such as handbags that could hinder the customer to engage in the co-creation process. Equally, the product or

service should reflect a work-in-progress status to encourage input from customers. Given the importance of knowledge and resources accessible to customers (Normann, 2001), the design of the business islands should be structured in a way similar to a film script, incorporate key elements in a logical and coherent order, and contain signage for self-explanatory description.

6. Finally, the data collection approach emerged as a critical co-creation factor. A living lab should be prepared to capture customers' first impression and authentic feedback. Informed by the data collection tools that can be used in this setting, JOSEPHS can obtain information on early product or service developments that give unique insights. Similarly, explicit research questions are an important element to define the research objectives for the project. These should be formulated clearly and communicated in an appropriate manner to customers. Workshops should be utilised to address very particular topics of interest to the company - also considering if it operates in a B2C or B2B industry – and the structure of the workshop should be adapted to the complexity of the co-creation task.

Discussion

The six critical factors for co-creation facilitation provide a framework that shows how co-creation in a living lab is facilitated. Interestingly, existing literature does not focus on aspects relating to the operating principle and data collection approach. The operating principle of the living lab plays a major role for companies because it outlines the concept and values of the living lab and how companies can engage with it. The data collection approach is also critical to companies because of its uniqueness. JOSEPHS however, is mainly concerned with the operational goals and the relationship to the customer. For similar reasons, emphasis is put on the atmosphere, data collection approach and design layout of the living lab as well as individual business islands. In addition, design layout is not extensively discussed. However, attention is paid to behavioural aspects, motivation, and incentives of the customer which in turn is acknowledged but not seen as critical by living lab facilitator nor companies. On the other hand, companies would like to obtain further benefits from their living lab experience e.g. sharing best practices of past cases. Furthermore, companies consider only the relationship between them and JOSEPHS as important, although the customer is the one involved in the co-creation process with the company.

Table 3 – Six critical factors for facilitating co-creation in living labs

1. Customer Engagement	2. Relationship Management		3. Atmosphere	4. Operating Principle	5. Design Layout	6. Data Collection Approach
Attitudinal factors	Participation		Enthusiasm (but no sales pitch)	LL as a consulting / service provider	Access to operant resources	Data collection tools
Willingness to co-create	Dialogue		Prevent embarrassing situations	Feedback integration and adjustment	Service Facilities	Explicit research question
Social context	Relationship		Proactive guidance	Establishing ‘themes’	‘Hands-free’ approach	Workshops to reach specific audience
Perceived relevance of the service	Integration/involvement		Room for action/ interaction/ discontinuation	Relevance for B2C and B2B	Design of Island: key elements and order	Capture the first impression
Personal goal clarity	Interaction		Comfortable atmosphere		Elements of familiar behaviour	Receive authentic feedback
Customer capabilities, skills and motivation	Expected benefits				Reflect WIP status to encourage feedback	Appropriate level of structure – B2B or B2C
Mobilizing behaviour	Relationship JOSEPHS - Customer	Relationship JOSEPHS – Company			Self-explanatory signage	
Type of service/ product	Quality of employee interactions	The firm’s willingness to integrate customers resources			‘Film script’	
	Managing customer expectations	Information about company background			Intuitive and playful elements	
	Convey the seriousness of customer contribution	Sharing of best practices				
	Tailored approach for guidance	Consulting through a tailored project template				
	Opportunity to give feedback about JOSEPHS	Creation of networking opportunities				
	Well-trained and enthusiastic guides	Communication via online tool (medium)				
	Recruitment & training	Managing firm expectation				
	Internal communication possibilities	Transparency and accessibility of knowledge & learnings				



Co-creation elements derived from existing literature



Co-creation elements derived from data collection with companies



Co-creation elements derived from data collection with living lab facilitators

Conclusion

The framework developed through this study (Table 3) identifies 54 elements grouped in six critical co-creation factors; their implications for facilitating co-creation in living labs were examined and discussed. The contributions of this study are therefore both theoretical and practical.

This study contributes to theory identifying new facilitating elements for co-creation in living labs: 15 co-creation elements are derived through data collection with companies and 21 co-creation elements emerged through data collection with living lab facilitators. This study also supports 18 co-creation elements already reported from literature.

The study contributes to practice by creating first insights into the operational activities and design structures which are implemented to facilitate co-creation in living labs. In particular, living labs and companies gain deeper understandings on the factors that are relevant to consider when engaging in co-creation. Through this research also JOSEPHS gains further insights on how to maximise co-creation outcomes, visitors contact time and idea encouragement.

This research was focused on a limited number of companies, and its results offer therefore limited opportunities for generalization. Further research is needed to achieve a more comprehensive view of value co-creation across various company types and sectors. The present work can serve as a basis for developing evaluation mechanisms in order to assess the effectiveness of the critical factors facilitating co-creation in living labs.

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