PROJECT-BASED SERVICE

• ABSTRACT •

The paper examines the value co-creation process within project-based service environments that perform complex and different service-oriented projects. An approach is proposed based on the service-oriented perspective to reconcile project management and the co-creation process and to drive the partnership to its full potential and mutual success in project-based service environments. To validate the framework, we resort to a Living Lab for supporting digital marketing transformation. The results show that service organizations can better exploit their organizational capabilities and thus enhance their performance by integrating project management, co-creation processes and service-oriented frameworks.

MANAGING CO-CREATION PROJECTS:

The Service-Oriented Perspective

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1.INTRODUCTION

It can be observed that although project management is well documented from the provider's side, either the literature seems to devote less attention to the customer's side or the customer's side is ignored in the description of the project. This drawback seems to stem from the complexity of co-creation process management within the context of project-based service environments because of the need to take into account the partnership between different economic entities in different stages of the life cycle of the organization. To fill this gap, the project-based service organization has been proposed for managing high-value, complex industrial products and systems that underpin the production of goods and services (Hobday, 2000), and the process of co-creation has been proposed to integrate the service provider and the customer (Prahalad and Ramaswamy, 2004; Vargo et al., 2008).

The purpose of this study is to propose an approach based on the service-oriented perspective to integrate project management and the value co-creation process to provide for the full potential and mutual success in the project-based service environment. This integration allows firms to exploit their organizational capabilities in a superior manner and thus enhance their performance. Consequently, there is an urgent need for a novel approach to facilitate the mutual work of the different actors belonging to the ecosystem and to provide a better conceptual understanding and new management practices for the project-based service environment.

To demonstrate the framework, the paper presents an illustrative case of the framework for the design and management of a specific project, developing a Living Lab for supporting business development in the domain of digital marketing. A Living Lab is defined as an ecosystem that promotes collaboration between a university and the business community to work closely together to promote innovative ideas through co-creation and experimentation in real-life use cases to solve problems.

The remainder of the paper is structured as follows. Section 2 presents the theoretical background. Section 3 investigates the literature on managing co-creation projects. Section 4 explains the framework for managing co-creation projects. Section 5 continues with an illustrative case extracted from an application of the framework for designing and managing a specific Living Lab for supporting business development in the field of digital marketing. Some conclusions and further research perspectives are generated in the last section.

2. THEORETICAL BACKGROUND

In general, the term "co-creation" refers to situations in which users collaborate with enterprises or with other users to create value. Co-creation has been attracting considerable studies in many fields, particularly in service research, management research, innovation research, and design research (e.g., Prahalad and Ramaswamy, 2004; Sangiorgi, 2012; Vargo and Lusch, 2016). Co-creation helps boost the chances of success by pulling the customer further into the fold. Com-

panies engage in co-creation projects because they want them to foster the discovery of customer interest and value, which they can turn into innovation and competitive advantage. Value co-creation in a project includes three phases. The first phrase is the co-creation of value-in-use, whose impact does not finish before the starting point of the next phase but gradually decreases over time. The next two phases are implementation and post-completion. They are the extended transaction phase derived from the service experience. Accordingly, consumption occurs before project completion and is considered part of the service experience. At the starting point, the focus is on improving the service experience and co-creating value-in-use.

As illustrated in **Figure 1**, the co-creation process can be viewed through three different lenses in a service business:

• a value co-creation view embedded in strategic thinking and business models;

• a co-production view embedded in customer relationships and interactions; and

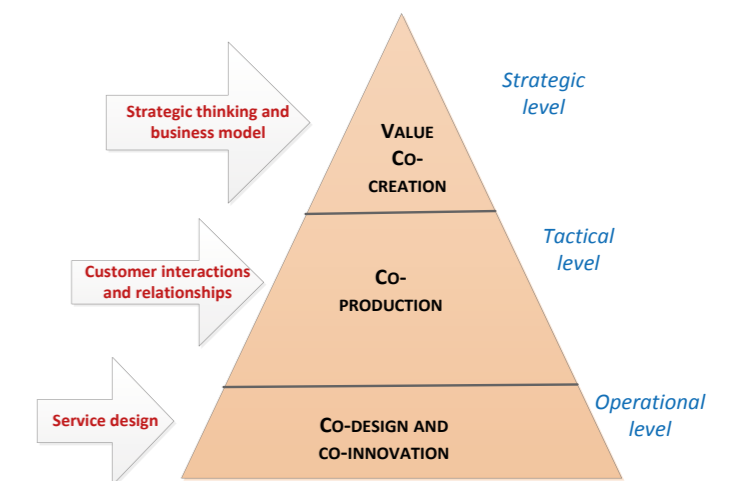• a co-design and co-innovation view embedded in the service design (Keränen et al. 2013).

FIGURE 1: Co-creation process

-- 2.1 Value Co-Creation --

Co-creating value with customers means involving the consumer fully in the process. In business projects, value co-creation is implied in both the execution and the operation phases. Value can be considered a special benefit under different conditions (place and time) during the time of usage. Therefore, value co-creation is defined as a joint and unique process with the aim of improving the condition of factors and the project outcome as a final goal (Vargo and Lusch 2016).

The literature on value co-creation has expanded significantly, utilizing a rich variety of concepts such as co-design and co-development

of the value propositions, as well as co-learning, which includes joint organizational learning and relationship learning, and co-innovation. In all of these concepts, the prefix "co" indicates shared work among actors within dyadic relationships, multilateral networks and ecosystems (Kohtamäkia and Rajala 2016).

-- 2.2 Co-production --

Value co-production is defined as the voluntary or involuntary involvement of service users in any phases of the product and service supply, such as designing, managing, delivering, and evaluating the product and service (Osborne, 2016). The involvement of service users in project management aims to improve the product and service quality.

Value co-production is controlled by the providers of the product and service (Brandsen and Pestof, 2006). In a project, co-productive elements are in a continuous sequence rather than a steady sequence. Production and consumption occur through an electronic interface, not directly and immediately. For instance, the co-production of a financial service is basically passive due to the activities of the service providers and the users are at different times. The contribution of the product and service user as a co-producer contributes to value co-creation for the user. This value involves satisfaction with the product and service. In a broader sense, this value meets the user's social, health and economic needs. Thus, project management is more effective owing to co-production.

-- 2.3 Co-design and co-innovation --

Co-design is considered as an important factor of co-creation, creating values and controlling value co-creation. At different levels, co-design creates different co-creation values in a service ecosystem, which includes the market, physical infrastructure, the community, and the environment. There are five levels of service co-design, including co-design the service experience, co-design the service concept, co-design the static service system, co-design the dynamic service system, and co-design the service encounter (Teixeira et al., 2012).

Co-innovation is based on a crowdsourcing platform in which new ideas or approaches from various internal and external sources are applied differently to create new value or a new experience for all stakeholders, including consumers (Lee et al., 2012). In general, enterprises work with known partners in the co-creation process; in contrast, they may work with unknown partners in the co-innovation process. Crowdsourcing depends on a virtual network of individuals who are competitive and cooperative with the aim of delivering products and services to customers. Firms use an online crowdsourcing platform, and it acts as an intermediary to attract the crowd's the resources. Crowdsourcing is described as a place for "people who have hobbies, those who work part-time, and amateurs who have a market for their efforts", and "firms in all industries find out how to use the crowd's hidden talents" (Howe, 2009).

3. MANAGING CO-CREATION PROJECTS

-- 3.1 Management of value co-creation projects --

The management of co-creation projects is a relatively new topic. Previous studies were limited to the co-creation in project management. Value co-creation should be carefully implemented because if co-creation is not managed well, then negative outcomes from the project could be the result (Smyth, 2015).

Indeed, in recent years, there have been several studies that focus on service in a business project. Service dominant logic (SDL) has appeared as a foundation for value co-creation management. Previously, servitization encouraged manufacturing firms to add value through service delivery (Vandermerwe and Rada, 1988). A recent study by Chan et al. (2015) indicates that businesses have made great efforts in the servitization of their business. Value addition and a high-quality service supply contribute to improving business performance by strengthening firms' competitive advantage. Furthermore, the inequalities in capacity, conflicts and the volatility of long-term relationships must be carefully considered (Alderman and Ivory, 2007).

Artto et al. (2008) show that some organizations maintain an upstream trend by delivering the project due to demanding impacts. In general, an organization's innovation and value chain promotion are considered high-value but slow solutions because new capabilities must be developed under new business models. Servitization is led by organizations with a limited manufacturing capacity.

-- 3.2 Management of co-production projects --

Different projects have proper goals, scopes and necessary capacities. According to previous studies, there are four characteristics of co-production, as follows. Firstly, co-production is the process in which product and service users co-produce the product and service experience with staff (Etgar, 2008). Secondly, co-production is a voluntary and conscious activity. It creates the capacity within product and service delivery systems to improve the product and service (Lengnick-Hall et al., 2000). Thirdly, co-production focuses on the product and service system rather than each product or service. The experience of the user interacts with the product and service system for developing (Schembri, 2006) their "lived experience" of the product and service. Finally, the involvement of product and service users not only improves existing products and services but also co-innovates new forms of product and service delivery within the product and service system (Dinesen et al., 2011).

Osborne and Strokosch (2013) have found two unconnected research directions of value co-production on the basis of two perspectives: i) the public administration perspective and ii) the service management perspective. The public administration perspective considers that product and service providers and users depend on each other. Product and service providers depend as much on the community for policy implementation and product and service delivery as the community depends on them. This forms the concept of co-production in public administration. Subsequently, the public administration co-production

literature has popularly developed in the United States, Europe and Australia.

On the other hand, co-production is considered a service characteristic, together with intangibility and inseparability. Lusch and Vargo (2006) indicate that a service is not an industry activity. It is the process in which value is added to any service or product. This means that value is co-created simultaneously with the transformation of service components at the point of co-production. Thus, co-production is the process of creating product and service value. The product and service do not have any intrinsic value to their users. This value is co-created through co-production. Service theory affirms that the service user provides the deepest understanding of service delivery improvement. Several researchers suggest that more than two-thirds of service improvement models are derived from the experience and improvement involvement of users.

-- 3.3 Management of co-design and co-innovation projects --

In recent years, project management has faced many changes, particularly in managing co-innovation projects such as crowdsourcing projects. The Internet facilitates access to relatively less expensive resources, specifically human resources. For executing a project, members are easily sourced from a crowd and are expected to accomplish particular tasks. The participants can come from any country, provided that they register with a certain connection website, such as Amazon Mechanical Turk (Amazon, 2014). Thus, Howe (2009) has coined the term "crowdsourcing" to indicate the resources for a project via the Internet. Crowdsourcing co-creates assets, capability, and knowledge sharing layer value. Furthermore, management layers may be applied. Accordingly, crowdsourcing can expand a start-up's research and development function (Tobing, 2015).

According to Simula (2013), for crowdsourcing, there is much evidence that indicates successes and failures. This situation raises questions regarding the benefits and risks of a project that uses crowdsourcing. By understanding these benefits and risks, the project manager can grasp appropriate knowledge for the project successes of crowdsourcing. Gido and Clements (2012) suggest a set of attributes for a project

that can be used as a guide for project management. Concerning the human-resource attributes, the benefit of low labor costs and a wide labor selection can encourage the decision to use crowdsourcing. Some researchers note that labor management is different from traditional project management, in which labor is the internal staff. Indeed, there are some problems in project performance and security. It is also suggested that there should be further studies on the factors affecting the success and failure of projects that use crowdsourcing. In addition, the project team should identify the key factors for maintaining project quality, particularly for projects that use information from the crowd. One of the solutions given by Keränen et al. (2013) is the involvement of the crowd for improving data quality by providing structured data, selecting work, or collecting and evaluating data.

4. FRAMEWORK FOR CO-CREATION PROJECT MANAGEMENT

As discussed above, there is a need for a solid foundation for managing co-creation projects that take into account different levels of the co-creation process such as value co-creation, co-production, and co-design and co-innovation. This section presents the framework for co-creation project management (CCPM), hereafter called the CCPM framework. This framework has adopted and enhanced the results from previous research and industrial projects, particularly the information-driven framework for designing service-oriented systems (Le Dinh and Pham Thi, 2016).

The proposed framework is a set of interrelated concepts representing a thorough understanding of services, service systems and value creation networks. Consequently, the framework consists of three levels of a service-oriented paradigm (**Table 1**). The service value creation network level, focusing on value co-creation, depicts the particular networks of service systems and shows how values are proposed and exchanged between economic entities. The service system level, focusing on co-production, specifies service systems and determines the roles of people, technology, and shared information (Le Dinh et al., 2016). The service level, focusing on co-design and co-innovation, presents what is provided to stakeholders and how it is provided

Dimensions	*Level*	*Objectives*	*Co-creative elements*
Management	Service value creation network	Service proposal	Value co-creation
Science	Service system	Service creation	Co-production
Engineering	Service	Service operation	Co-design and co-innovation
TABLE 1: The concepts of the CCPM framework			

The service-oriented perspective is based on the principles of Service Science, Management, and Engineering (SSME), which are composed of three elements: science, management and engineering (Spohrer et al., 2007). The management dimension concerns the strategic perspective for co-creating more value for existing business services and for providing new business services to promote value co-creation. The science dimension addresses the structure of service systems and clarifies the process of service creation, aiming to support the co-production process. The engineering dimension covers the invention of new technologies to improve the quality of existing business services and to create new and innovative services owing to co-design and co-innovation initiatives.

-- 4.1 CCPM framework at the service value creation network level --
At the service value creation network level, the CCPM framework focuses on the of value, network and collaboration dimensions (Le Dinh and Pham Thi, 2016).

The value dimension aims to represent the value creation and exchange process. Firstly, the project team must determine the co-creation models of its project. In the literature, there

are three co-creation models (Payne et al., 2008). The customer value-creation model provides processes, resources and practices that customers use to manage their activities. The supplier value-creation model provides processes, resources and practices for the supplier to manage its business and its relationships with customers and other relevant stakeholders. The encounter value-creation model provides processes and practices of interaction and exchange that occur within customer and supplier relationships to develop successful co-creation opportunities.

Secondly, the project team continues to identify the mission, objective and characteristics of the value dimension. Gibbert et al. (2002) present the five styles of value co-creation. The prosumerism style develops tangible assets and benefits to obtain improved products and resulting benefits. The team-based co-learning style creates corporate social capital to facilitate team learning for addressing systemic change. The mutual innovation style creates innovative products and processes to maximize the return from new ideas. The communities of creation style perform a specific mission to obtain and explicate professional expertise. The joint intellectual property (IP)/ownership style facilitates tangible customer IP sharing to reach the maximum returns on IP (jointly).

Finally, the capabilities of each business entity in the eco-system must be evaluated. Co-creation requires certain capacities for creating values such as the individuated interaction capability, the relational interaction capability, the ethical interaction capability, the empowered interaction capability, the developmental interaction capability, the concerted interaction capability, and the learning capability (Karpen et al., 2012).

The network dimension includes key concepts such as the economic entity and the network governance form and role (Le Dinh and Pham Thi, 2016). Each economic entity is a stakeholder of the network, and it can be an individual, an enterprise, an organization, or a government agency. A service value creation network is composed of a variety of economic entities that assume different roles in the network. Based on the co-creation model, the project team identifies the roles of each stakeholder.

Each network is subject to a form of network governance (Le Dinh and Pham Thi, 2016), including the market, hierarchy and network forms. The market form is a system of agents in which an agent can provide products and services to other agents. The hierarchy form is a system in which each part is precisely defined as performing a specific function. The network form is a system that helps its members collaborate, based on a relationship of trust. The form of network governance can be identified based on the co-creation model and style.

The collaboration dimension indicates the interdependencies between economic entities and the manner in which they work together in a service value creation network that requires both intra- and inter-organizational collaboration. Knowledge sharing reflects the interdependencies between economic entities in a network and is governed based on two concepts: the overlap situation and the

overlap protocol (Le Dinh and Pham Thi, 2016). An overlap situation occurs when there is at least one element of a business service shared and governed by several business entities. An overlap protocol is a protocol that not only allows each economic entity to perform its own business processes locally but also enables them to be aware of the business processes performed in other economic entities. Based on the co-creation style, the project team can determine the knowledge that will be shared, identify the overlap situations, and decide what overlap protocol can be used to co-cooperate in managing these overlap situations.

-- 4.2 CCPM framework at the service system level --

The service system level, concerning co-production, involves the configuration and implementation of business services in a service system to ensure that all of the created services have adequate resources and sufficient technological support.

The implementation dimension, including the relations between shared knowledge, technological solutions and the necessary resources, aims to improve business services through information technology.

To specify this dimension, the project team must indicate the business units, business service, business process, technical implementation, and required resources. A business unit is an actor representing a part of a service organization. A process is a response by the service system to the occurrence of an event that can be implemented by one or several technical implementations. Specific resources are required for these technical implementations. A business service is operated by a subset of business processes, requiring specific resources for their technical implementations.

-- 4.3 CCPM framework at the service level --

The service level, which concerns co-design and co-innovation, emphasizes what is provided to stakeholders and how it is provided. In other words, this level addresses different aspects related to the service operation.

To specify the service operation, a service-oriented project is organized based on the three aspects of knowledge: the static, the dynamic and the rule aspects (Le Dinh et al., 2016). Firstly, the rule aspect of a project is stated as a subset of the business rules representing its mission, objectives and legal aspects. Secondly, the dynamic aspect shows how to obtain the desired situation that can be specified using dynamic states. The dynamic states of a service are the conditions, modes or situations during which certain business activities are enabled and other disabled. Finally, the static aspect concerns the artifacts of the function of the base organization (Le Dinh et al., 2016), which can be new facilities such as buildings, IT systems, procedures, business practices, or equipment. The artifacts are required depending on the desired situation and can be managed according to the traditional project management triangle: time, cost and quality (Andersen, 2014).

5. ILLUSTRATIVE CASE

This section presents an illustrative case extracted from a specific Living Lab project performed in the Laboratory for Enterprise Development in Developing Countries (larideped.org) at the Université du Québec à Trois-Rivières, Canada, for business development. The project aims to support the digital marketing transformation in small and medium-sized enterprises (SMEs). This project elaborates the Living Lab and its application in the context of business startups and continuous performance improvement in the areas of e-commerce and digital marketing. The purpose of the Living Lab is to promote innovative ideas and, subsequently, digital innovation through co-creation and experimentation in real-life use cases. The case highlights the effectiveness of the proposed framework towards integrating stakeholders within their continuous improvement effort.

-- 5.1 Management of the value creation network --

The Living Lab approach is considered a user-centered and open innovation ecosystem that focuses on engaging stakeholders in research and digital innovation to promote the co-creation process (Pallot et al., 2010). As an ecosystem, the Living Lab supports different roles such as the beneficiary, the enabler, the provider, and the user (Eriksson et al., 2005; Sarjanen, 2010). Beneficiaries are entrepreneurs or SMEs that participate in the upgrading program. Enablers create the general infrastructure and policies that allow the Living Lab to operate. Providers promote business startups and continuous performance improvement, including academia as well as emerging technology and service providers. Users are in an important position since they are the driving force for digital innovation.

The project focused on the customer value-creation model to perform a customer-focused transition and to improve marketing performance. The team-based co-learning style has been chosen for the internal e-collaboration between the team (e.g., enablers, beneficiaries and providers) and the communities of creation style for the external e-collaboration between the team and the community. Concerning the network governance, the hierarchy form is used for internal e-collaboration and the network form for the external e-collaboration between the team and the community.

Figure 2 presents the stakeholders of the Living Lab project. In collaborating with local business development, universities play the role of enablers to promote the digital marketing transformation. Indeed, there is a real potential for universities to play a role in open innovation processes (Levén and Holmström, 2008). Startup founders, entrepreneurs, and small business managers are beneficiaries of the project. During the business creation phase, they can exchange ideas or be advised in regard to their marketing plan and strategies.

During the business operation phase, as principal providers, students, under the supervision of their professors, can join and co-analyze the business performance of beneficiaries, forecast
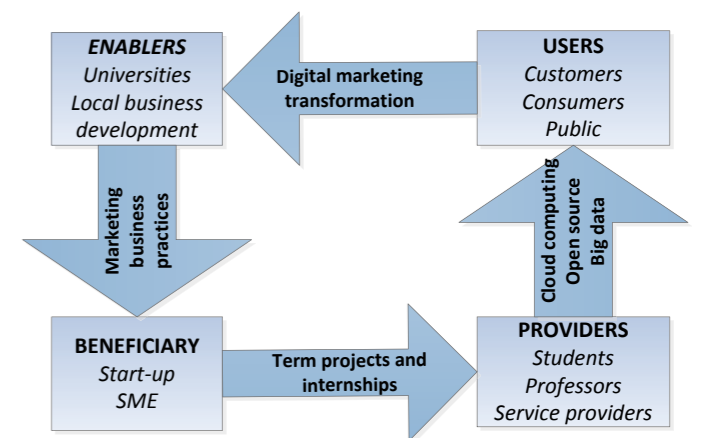

FIGURE 2: Stakeholders of the Living Lab project

their opportunities and challenges, and support their transition to customer-focused organizations. In collaborating with service providers, students can also propose best practices and solutions for enterprises to better manage their business to ensure continuous effectiveness.

In addition to the direct beneficiaries, the community as users, including end users, consumers and the public, will also benefit from the project owing to sustainable development and corporate responsibility since the Living Lab approach minimizes the consequences of business failure or bankruptcy. In particular, the community takes on a high potential as a driver of value co-creation and digital innovation that can play an important role in digital marketing transformation, particularly in the customer experience and customer-focused transition. At present, new trends such as cloud computing, open source and big data are lowering the barrier to entry into business for startups and SMEs and helping them exploit new opportunities in the digital era.

-- 5.2 Management of the service system --

Figure 3 presents the key business services provided by the Living Lab project.

At the operational level, the internal e-collaboration space provides tools and services for beneficiaries, providers and enablers such as an e-workspace and groupware that support and facilitate the online working environment for individuals and teams (Le Dinh et al., 2012). On the other hand, the external e-collaboration space provides collaboration tools and services for users. Indeed, there are many different web-based collaboration services that act as the intermediary between requesters – the project participants – available on the Internet. Typically, a project is completed through communication and community interaction without signing formal contracts. The start-ups typically restrict the project control. Instead, completion depends on the crowd's voluntary participation. A start-up can create its own community to facilitate digital innovation. Firms can take part in the third community for promoting the crowd's intellectual power. In addition, in some cases, the
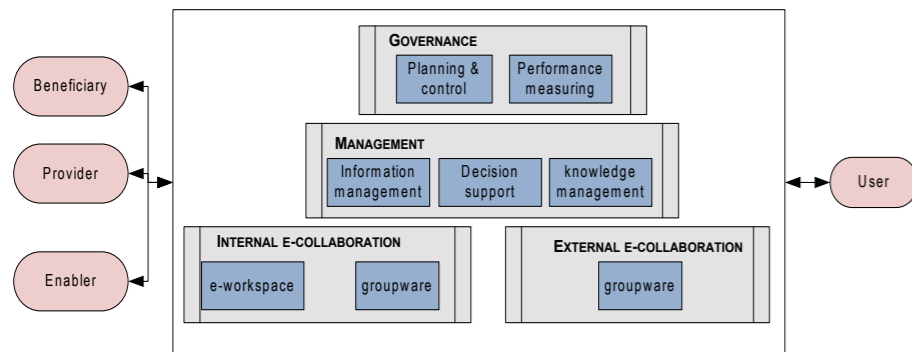
start-up is not necessary to directly connect to the community; however, it still benefits from the community.

At the informational level, the management space provides different tools and services for managing business information such as enterprise applications, customer relationship management, and supply chain management as well as decision support and knowledge management. In particular, community crowdsourcing involves the engagement of a particular online community, including individuals and organizations with different types of knowledge, skills, and qualifications. The knowledge sharing and community interaction platform establishes the communication mechanism and the management mechanisms.

At the strategic level, the governance space provides tools and services for project planning, project control, and performance management. Concerning performance management, the project team will identify and specify the principal key performance indicators (KPIs) through the services of the management space by applying the service science perspective. The overall objectives involve prospecting, attracting, and winning the confidence of new customers; maintaining available partners; regaining former customers; reducing marketing expenses; and expanding customer services. In addition, SMEs can also use business software to collect information for their own management purpose.

According to Gibbert et al. (2002), each co-creation style requires specific services. The prosumerism style requires planning and control and decision support; in contrast, the team-based co-learning style requires knowledge management, decision support, and customer information management. Moreover, groupware is required by the mutual innovation and joint IP/ownership styles. Finally, the communities of creation style requires decision support and groupware.

-- 5.3 Management of services --

The rule aspect can be used to specify the mission breakdown structure (Andersen, 2014). A mission of a project is to support the development of the base organization based on what constitutes its desired future situation. The future situation can be better performance, a more competitive role in the marketplace or better decision-making. Consequently, the mission may propose a reorganization and enhance its capability with a new product, a new market or a new channel of distribution.

Considering the nature and complexity of a Living Lab, it is important to sustain dynamic collaboration effectively and smoothly throughout the project and to facilitate communication within and between project teams (Dubé et al., 2014). Since Living Lab projects (e.g., projects supported by the Living Lab) are typically exploratory projects, which are characterized by an important uncertainty, a project management approach based on the principles of agile project management is chosen. The project is continuously developed through a series of incremental iterations over time (Larson and Gray, 2011). Each

iteration aims to elaborate a specific feature, which is defined as a part of a business service that delivers some useful functionality to customers such as e-commerce websites, a digital marketing strategy, the online customer experience, marketing communication, and digital channel performance.

Managing an iteration of a Living Lab project includes its particular activities such as diagnostics, exploration, experimentation, evaluation and diffusion (Lehmann et al., 2015; Le Dinh et al., 2016). Based on these activities, the corresponding dynamic states are determined as explored, experimented, evaluated, and diffused.

6. CONCLUSION

This paper proposed an approach based on the service-oriented perspective to reconcile project management and the co-creation process in project-based service organizations. The framework includes a set of concepts and guidelines at three levels: the service value creation network level for value co-creation, the service system level for co-production, and the service level for co-design and co-innovation. To the best of our knowledge, this research is one of the first studies to provide an effective framework that is best suited for designing and managing complex co-creation projects based on the service-oriented perspective.

Concerning the implications of our work in practice, the proposed approach enables and facilitates the improvement and creation of co-creation business services. The three levels of the proposed approach help service organizations thoroughly design the value proposition and exchange in a network, use recent technologies to effectively implement the efficiency of their services in a service system, and manage the efficiency of their service operations.

Concerning the implications for research, the approach must be validated and studied on a broader scale. Moreover, our future research aims to study the construction and management of self-organized teams in the Living Lab environment and to support service organizations in achieving service performance maturity.

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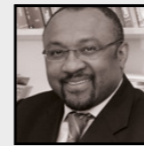
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