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IT-Enabled Service Innovation—A Field Study of Agile Approaches to Value Co-Creation

Fabiola Corvera-Stimeling

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IT-Enabled Service Innovation—A Field Study of Agile Approaches to Value Co-Creation

BY

Fabiola Corvera-Stimeling

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ACCEPTANCE

This dissertation was prepared under the direction of FABIOLA CORVERA-STIMELING'S Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctoral of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

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IT-Enabled Service Innovation—A Field Study of Agile Approaches to Value Co-Creation

BY

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Service organizations need to respond rapidly to both changes in the market and customer expectations. One way of accomplishing this is through service innovation enacted to achieve competitive advantage. This study applies a service-dominant logic (SDL) lens to describe how a service organization may achieve service innovation through value co-creation that is facilitated by agile distributed methods. Literature on value co-creation is somewhat limited; although a few studies have provided guidance on what is needed to achieve value co-creation, no study has yet presented how this might be achieved. Therefore, using a single-site case study in the context of a large service organization, this study examines how value is co-created and the role that agile distributed methods play in this process. This research seeks to contribute to practice by providing service

organizations with recommendations for achieving value co-creation. It contributes to theory by advancing our understanding of value co-creation processes; moreover, by using the context of an SDL, it presents a framework that maps elements of service innovation to agile distributed practices.

Keyword: service organizations, service innovation, service-dominant logic, value co-creation, agile distributed development

I CHAPTER I: INTRODUCTION

Value co-creation is a collective process through which the interactions of a firm and its customers facilitate the creation of value (Grönroos & Voima, 2013; Ramesh et al., 2012). Recent research has not only recognized that value co-creation is a way to achieve service innovation (Lusch & Nambisan, 2015; Vargo et al., 2008), but has also acknowledged the need to further explicate the service innovation structures that facilitate value co-creation (Lusch & Nambisan, 2015). Service-dominant logic (SDL), first introduced by Vargo and Lusch (2004), redefined service, emphasizing the processes involved in the exchange of specialized skills and knowledge between stakeholders instead of the traditional conceptualization of services (plural) as pure units of output (Lusch & Nambisan, 2015). Ramaswamy and Gouillart (2010) highlight the importance of understanding the role of the different stakeholders, such as employees, vendors, and customers, in the value co-creation process.

More than 50 years ago, marketing began to shift its focus to customers instead of the distribution and exchange of products (Vargo & Lusch, 2004). Thus, customer centricity began receiving special attention; however, the emphasis was still on the product and the firm, with a primary focus on selling to customers more of what companies produced (Bettencourt et al., 2014). When the US service industry outdistanced manufacturing from an employment perspective in the beginning of the 21st century, it began capturing more attention (Schettkat & Yocarini, 2006), and the transition from the goods or product-view perspective to the service or solution-view perspective gained attention. In the late 1990s, a few companies started focusing more on customers by welcoming their participation in product development efforts (Ramaswamy & Gouillart, 2010). The emerging relationship between the customer and the organization, in which value was jointly created by both parties, was originally recognized as value co-creation by Prahalad and Ramaswamy (2004b). New technologies have facilitated additional ways for customers, vendors, employees, and stakeholders to co-create value together (Ramaswamy, 2009). Moreover, service organizations can no longer effectively design services without customers' input

(Prahalad & Ramaswamy, 2004a). Customers also want to interact with firms and co-create value together (Prahalad & Ramaswamy, 2004a).

For some service organizations, adapting value co-creation processes enabled by new technologies is challenging (Jana, 2007). For mature service corporations, incorporating value co-creation activities is even more challenging, due to their fragmented organizational structures. These challenges dampen such corporations' ability to innovate, effectively respond to customer expectations, integrate fragmented systems, and manage (as well as exploit) the data being generated by their services (IBM-Research, 2004). Organizations are increasingly facing both intense external demands to differentiate themselves by being innovative intense internal pressures to fight organizational inertia (Nijssen et al., 2006). Since service firms are highly susceptible to imitation, innovation is extremely important for them to thrive (Tatikonda & Zeithaml, 2002). Despite its importance for gaining competitive advantage, service innovation, in most organizations, has typically been reactive to changes in customer demand or to the availability of new communication and information technologies that provide new opportunities (Ettlie & Rosenthal, 2011). The failure to evolve and respond to change confines the organization's ability to advance (Cao et al., 2004) and innovate (Highsmith & Cockburn, 2001).

Service innovation has gained significant momentum among business leaders and academics, in part, due to the advancements in information technology (IT) that facilitate it (Jana, 2007). Recent studies have extended our understanding of service innovation driven by information and communication technologies; however the conceptualization of service innovation related to the design of services still needs further study focusing on the roles of different stakeholders in this process (Barrett et al., 2015). Companies innovate as a way to gain competitive advantage and improve their performance (Damanpour et al., 2009). However, a number of studies have recognized the lack of attention paid to service innovation in organizations (Sheehan, 2006). This limitation is even more significant because the patterns of innovation in the service industry differ from those in the

manufacturing industry (Sheehan, 2006). Thus, service organizations cannot rely on innovation processes that have been successfully used in manufacturing industries to achieve success in service innovation. Ettlie and Rosenthal (2011) identify the need to carefully study the processes used to achieve service innovation in service organizations. They suggest the use of in-depth case studies in order to explore service innovation strategies and structures.

The foundational premises of SDL move away from the traditional marketing-centered view, in which the primary unit of exchange between the firm and the customers is goods, and the customer's only role is to be the recipient of those goods (Vargo & Lusch, 2004). SDL views this exchange as an interchange of specialized knowledge and skills, and the customer is always considered a value co-creator (Vargo & Lusch, 2004, 2008). Grönroos and Voima (2013) identify some limitations with the foundational premises described by Vargo and Lusch (2008), suggesting a reconsideration of the role of the firm and the customer in the value co-creation process (Grönroos & Voima, 2013). Grönroos and Voima (2013) observe that the role of the firm is not restricted to making value propositions, as defined by Vargo and Lusch (2008); instead, the firm can also be part of a value co-creation process that includes its customers. We study value co-creation using SDL as the framework to study service innovation (Lusch & Nambisan, 2015), integrating the revisions proposed by Grönroos and Voima (2013).

Recognizing the lack of adequate understanding of service innovation, Sheehan (2006) discusses the need for additional research to understand the challenges associated with IT-enabled service innovation, due to the role IT plays in improving the competitive performance of service firms. Information systems are becoming the backbone of the services industry. Specifically, perceptions of technology are shifting, such that technology is becoming seen, not just as an enabler of business processes, but as the provider of the capability to achieve and maintain competitive advantage through increased scale, scope, and reach of business processes, as well as the facilitator of service design, delivery, and influence (Orlikowski & Scott, in press). IT, thus, plays an important role in value co-

creation. Technology can enhance the experience environment by enabling a value co-creation platform in which the firm and the customer interact and co-create value together (Prahalad & Ramaswamy, 2004c). Rai and Sambamurthy (2006) recommend more research in the area of digitized service innovation, due to the need to better understand service interfaces in order to engage the customer when defining, designing, and integrating services. Lusch and Nambisan (2015) suggest research that provides a deeper understanding of how IT can enhance service innovation by supporting value co-creation when designing new services. Extant literature describes the importance of building IS around the context of value co-creation experiences (Barrett et al., 2015; Prahalad & Ramaswamy, 2004c). It is important for managers to facilitate value co-creation through all points of interaction between the firm and its customers (Prahalad & Ramaswamy, 2004c). Prahalad and Ramaswamy (2004c) stress the importance of building a flexible infrastructure to facilitate the co-creation of experiences. Specifically, IT systems should be designed around what is important for the customer. They should also facilitate transparency and provide a unified view of the customer. A significant number of information systems (IS) are designed using a company-centric point of view instead of one focused on the needs of the frontline manager—who, in order to become experience-centric, needs to gain experience with and see things through the customer lens (Prahalad & Ramaswamy, 2004c).

The important role of the processes used to create IT-enabled products and services that are aligned with the evolving needs of the customer has received much attention in the literature. Specifically, agile development methods that have gained immense popularity in recent years recognize the central role of customers in the development of products and services (Barlow, 2011). Agile methods prioritize customer satisfaction through the early and continuous delivery of valuable software (Fowler & Highsmith, 2001). In particular, agile methods facilitate fast, intense, focused, and adaptive software development (Cao et al., 2004, 2009; Highsmith & Cockburn, 2001). Prahalad and Ramaswamy (2004c, p. 160) define agility as "the ability to act fast…and respond quickly to changes." Agile methods

have been recognized for their emphasis on value creation and their potential to facilitate value co-creation by involving customers throughout the project life cycle (Babb & Keith, 2011). In order for managers to successfully co-create value, they need to have the capacity for agility (Prahalad & Ramaswamy, 2004c). Recent research and practice has recognized the need to incorporate distributed development through agile practices. However, though agile distributed methods have been recognized for their emphasis on value creation, there is limited research on this topic (Madi et al., 2013).

Motivated by the lack of research on how value co-creation in service organizations can be supported by the development processes used in service innovation, this study examines the following question:

1. How does a service organization foster service innovation through value co-creation enabled by agile distributed methods?

We address this research question using a case study of a service innovation aimed at improving customer experiences in call center operations at a large service organization in the US.

This research makes several contributions. First, our study contributes to the service innovation literature by advancing our understanding of value co-creation processes. Specifically, we highlight the role of agile distributed practices in facilitating such processes. Second, building on the context of SDL, we propose a framework that maps elements of service innovation onto agile distributed practices. We contribute to practice by offering prescriptions for executives and managers on how to create an organizational environment that may foster such innovations.

I.1 Research Approach

We conducted an exploratory case study to understand how a mature service organization was able to achieve service innovation through value co-creation enabled by distributed

agile methods. The exploratory case study method has been extensively used to understand complex phenomena and to maintain the characteristics of real-life managerial processes (Yin, 2009). The exploratory case method also allows the researcher to answer the "how" questions and to understand the nature and complexity of the processes being studied (Yin, 2009). Thus, the case study approach is an appropriate way to research an area such as ours, in which few previous studies have been conducted (Benbasat et al., 1987).

Engaged scholarship is the participative form of research used in this study. This research approach will allows us to obtain a deeper understanding of how service organizations create organizational environments that foster service innovation through value co-creation enabled by distributed agile methods (Van de Ven, 2007). The components of this engaged scholarship are listed in Table 1 (Mathiassen et al., 2012).

Table 1 - Components of Engaged Scholarship

Engaged Scholarship Component	Research Component
Area of Concern (A)	IT-enabled service innovation.
Real Problem Setting (P)	Service organizations need to respond to the challenges of a dynamic and evolving market environment by creating and offering innovative services.
Framework (F)	Service-dominant logic.
Methodology (M)	Single-case study, semi-structured interviews.
Research Question (RQ)	How does a service organization foster service innovation through value co-creation enabled by distributed agile methods?
Contribution (C)	**Contribution to Theory** The study contributes to the service innovation literature by advancing our understanding of value co-creation processes. In the context of SDL, we propose a framework that maps elements of service innovation onto agile distributed practices **Contribution to Practice** The study provides service organizations with recommendations on how to achieve service innovation through value co-creation. In particular, it offers prescriptions to help executives and managers create organizational environments that may foster such innovations.

I.2 Chapter Summaries

The following chapters provide a summary of this empirical research.

I.2.1 Chapter 2: Literature Review

This chapter reviews the literature on the service industry and service innovation.

I.2.2 Chapter 3: Service-Dominant Logic

This chapter reviews service-dominant logic and its ten foundational properties. This work emphasizes value co-creation as one of the steps necessary to support service innovation. This chapter further illustrates distributed agile practices and the role IT plays in this process.

I.2.3 Chapter 4: Research Design And Methodology

In this chapter, the research methodology, data collection approach, and data analysis method are explained.

I.2.4 Chapter 5: Results

The results of the data collection are reviewed and analyzed through the theoretical lens of SDL.

I.2.5 Chapter 6: Discussion

This chapter reviews the study's major theoretical contributions and how they relate to the literature. This chapter also reviews the study's contributions to practice and theory. This study provides recommendations to help executives and managers create an organizational environment that fosters service innovation. The study contributes to theory by offering a better understanding of value co-creation processes and the role that agile distributed

practices have in enabling these processes. In addition, we propose a framework that maps elements of service innovation onto agile distributed practices on the context of SDL. Limitations of this study and suggestions for future research are also discussed.

This dissertation uses several abbreviations, which are listed in Table 2.

Table 2 - List of Abbreviations (in Alphabetical Order)

Abbreviation	Definition	Additional Information
AD	Application Development	
BRDs	Business Requirement Documents	
CIO	Chief Information Officer	
CRM	Customer Relationship Management	
CSR	Customer Service Representative	Internal customer
IS	Information Systems	
IT	Information Technology	
SDL	Service-Dominant Logic	
SMEs	Subject Matter Experts	
VDN	Vector Directory Numbers	Used for call routing
VP	Vice President	

II CHAPTER II: LITERATURE REVIEW

II.1 Area of Concern

The area of concern for this dissertation is service innovation enabled by value co-creation in a service organization. Next, I will provide a literature overview on service and service innovation.

II.1.1 Service and Service Innovation

The service industry began to attract attention when the manufacturing industry underwent a period of decline following World War II (Nijssen et al., 2006). In 2011, the US service industry represented 80% of the gross domestic product (The World Bank, 2012). Today, government and business services comprise approximately 75% of industrialized nations' economies (Galup et al., 2009)—and, in some countries, represent more than 50% of employment growth (Sheehan, 2006). Service organizations are exposed to a very dynamic environment, in which IT plays a transformational role, influencing how services are visualized, developed, and delivered (Rai & Sambamurthy, 2006). As Rai and Sambamurthy (2006) explain, service industries, such as banking, telecommunications, and healthcare, are struggling to integrate all their fragmented systems and platforms in order to create a unified view of customers and, thus, better serve and retain them. IT has significantly transformed the ways in which customers interact with service firms (Chae, 2014), and customers' attitudes on buying and consumption have evolved from passivity to the co-creation of value (Chae, 2012). Service companies that have been successful in service innovation have been able to collaborate with their customers by designing services to improve the customer experience and by simplifying service delivery (D'Emidio et al., 2014).

Much of the current understanding of service innovation comes from a product innovation perspective (Chae, 2014). Nijssen et al. (2006) compare product and service innovation and explain that both product and service innovation exhibit common traits: extraordinary

top executive involvement, cultures and systems that are aligned with the innovation, structured and proactive organization, and high-quality employees and resources (Nijssen et al., 2006). However, recent studies also identify differences between service and production innovation processes. Some of these differences are: intangibility, simultaneity (i.e., co-production with customers), diversity, and perishability (Nijssen et al., 2006; Tatikonda & Zeithaml, 2002). For example, while service innovation processes involve simultaneity, in which the service is produced and consumed at the same time and the customer is involved in both processes, product innovation processes do not (Tatikonda & Zeithaml, 2002). In addition, services are heterogeneous, such that consistency in service delivery is crucial (Tatikonda & Zeithaml, 2002). Lastly, services cannot be stored for later use, and what is not used is lost—but, conversely, if demand increases without an equal increase in service capacity, the demand is most likely lost (Tatikonda & Zeithaml, 2002).

Furthermore, service innovation processes tend to have shorter beta testing cycles than product innovation processes, due to the constant pressure to innovate (Ettlie & Rosenthal, 2011). Dotzel et al. (2013) describe the distinction from tangible, testable, performance, and risk perspectives. Ettlie and Rosenthal (2011) study the dissimilarity between service and manufacturing innovations in terms of how the innovation process is approached: Specifically, services tend to have shorter testing processes and to rely on senior management for innovative ideas. Faridah et al. (2013) describe intangibility and interactivity as the two main distinctions between service and product innovation, in most contexts. However, Martini et al. (2013) suggest that the concept of open product innovation, in which consumers are involved in the product manufacturing process, relies on interactivity as one of the core aspects of product innovation.

Table 3 presents some of the differences between service innovation and production innovation, as described in the literature.

Table 3 – Comparison of Service and Product Innovation

Service Innovation	Product Innovation	References
Intangibility: Services are performances or actions, rather than objects.	Tangibility: Products are objects.	(Dotzel et al., 2013; Faridah et al., 2013; Nijssen et al., 2006; Tatikonda & Zeithaml, 2002)
Simultaneity: Services are produced and consumed at the same time.	Separation: Products are manufactured first, then consumed.	(Nijssen et al., 2006; Tatikonda & Zeithaml, 2002)
Heterogeneity: Service performance is hardly constant.	Homogeneity: Product performance can be replicated through product quality.	(Nijssen et al., 2006; Tatikonda & Zeithaml, 2002)
Perishability: Unused services cannot be stored or inventoried.	Durable: Products can be stored and inventoried for later use.	(Nijssen et al., 2006; Tatikonda & Zeithaml, 2002)
Shorter beta testing cycles.	More extensive beta testing phases.	(Ettlie & Rosenthal, 2011)

Recent extant IS research has expanded our understanding of service innovation rooted in SDL, such that value co-creation is seen as part of the exchange between resources and stakeholders (actors) (Barrett et al., 2015). For example, Lusch and Nambisan (2015) offer a framework to study service innovation based on value co-creation, resource liquefaction (i.e., the decoupling of information), resource density (i.e., the mobilization of resources), and resource integration. This conceptual framework has yet to be empirically validated. Srivastava and Shainesh (2015) study service innovation in emerging economies, focusing on knowledge, technology, and institutions in order to develop sustainable value propositions. Scherer et al. (2015) explain the diverse effects of self-service and personal service channels on customer loyalty over time. Eaton et al. (2015) explain the role of boundary resources in the co-creation of a service system, such as Apple's iOS service system. These studies certainly expand our understanding of service innovation in an SDL context, but there is still a need to continue expanding our understanding of service and

service innovation by bringing together the literature in the marketing and IS disciplines in order to advance our knowledge of value co-creation processes (Barrett et al., 2015). Understanding service innovation in the context of a value co-creation process is interesting from both theoretical and practical perspectives.

II.2 Service-Dominant Logic

A service-dominant logic lens is used in this research to study service innovation, due to its emphasis on service as a central foundation (Chae, 2012). Service-dominant logic (SDL) departs from the need, specifically in the marketing field, to analyze services as an exchange of intangible resources, such as specialized skills, processes, and knowledge, rather than just an exchange of tangible goods. (Vargo & Lusch, 2006; Vargo & Lusch, 2004). Goods, also referred to as operand resources, are defined as resources "on which an operation or act is performed to produce an effect," while specialized skills and knowledge, referred to as operant resources, are described as resources "that produce effects" (Vargo & Lusch, 2004, p. 5). SDL uses the term *service* as a singular phrase to suggest the process of doing something beneficial for and in conjunction with some entity (Lusch & Nambisan, 2015).

Vargo and Lusch (2004) reject the conventional classification of services as an alternative form of products. For Vargo and Lusch (2006, p. 1), service is "what is always exchanged," and goods are the transmitters of intangible resources (Vargo & Lusch, 2004). Goods are "appliances (tools, distribution mechanisms) that serve as alternatives to direct service provision…and aids to the service process" (Lusch & Nambisan, 2015, p. 5).

Vargo and Lusch (2004) focus their SDL on intangible resources, exchange processes, and relationships in the context of eight foundational premises. These premises were later refined by (Vargo & Akaka, 2009); Vargo and Lusch (2008) as presented in Table 4.

Table 4 - Foundational Premises of SDL

	Premise	Explanation/Justification
FP1	Service is the fundamental basis of exchange.	As the application of operant resources (i.e., knowledge and skills), "service" is the basis of all exchange. Service is exchanged for service.
FP2	Indirect exchange masks the fundamental basis of exchange.	Goods, money, and institutions mask the service-for-service nature of exchange.
FP3	Goods are distribution mechanisms for service provision.	Goods (both durable and non-durable) derive their value through the services they provide.
FP4	Operant resources are the fundamental sources of competitive advantage.	The comparative ability to cause desired change drives competition.
FP5	All economies are service economies.	Service (singular) is only now becoming more apparent with increased specialization and outsourcing.
FP6	The customer is always a co-creator of value.	Value creation is interactional.
FP7	The enterprise cannot deliver value; it can only offer value propositions.	The firm can offer its applied resources and collaboratively (interactively) create value following acceptance, but cannot create/deliver value alone.
FP8	A service-centered view is inherently customer-oriented and relational.	Service is customer-determined and co-created; thus, it is inherently customer-oriented and relational.
FP9	All economic and social actors are resource integrators.	Implies the context of value creation is networks of networks (resource integrators).
FP10	Value is always uniquely and phenomenologically determined by the beneficiary.	Value is idiosyncratic, experiential, contextual, and meaning-laden.

In SDL, the term *service* receives special attention, due to its unique meaning. Specifically, service refers to what is exchanged, and it can be defined as "the application of specialized competences (operant resources – knowledge and skills), through deeds, processes, and

performances for the benefit of another entity or the entity itself – that is exchange." (Lusch & Nambisan, 2015; Vargo & Lusch, 2006). The term *service* places emphasis on service provision, in which goods are seen as vehicles for distributing a service (Lusch et al., 2010). Service in SDL implies a process of doing something for someone, in which the firm and consumer are resource integrators (Lusch & Vargo, 2006).

The framework presented by Lusch and Nambisan (2015) has four meta-theoretical foundational premises of SDL: actor-to-actor networks, resource liquefaction, resource density, and resource integration. Actor-to-actor networks are a central concept of SDL (Lusch et al., 2010). All actors are resource integrators and have the ability to create value (Lusch & Nambisan, 2015). Thus, Lusch et al. (2010) define a value network as a lightly coupled temporal structure composed of social and economic actors that interact through organizations and technology (Lusch & Nambisan, 2015; Lusch et al., 2010). The likelihood of a successful value network depends on its ability to respond, adapt, and learn rapidly, according to changes in customers' needs (Lusch et al., 2010). The ninth foundational premise (FP9) represents the network-centric perspective of SDL (Lusch & Nambisan, 2015), and it denotes the process of integrating and transforming resources (Lusch & Vargo, 2006). Resource integrators are all of the social and economic actors in a value network (Lusch et al., 2010; Vargo & Lusch, 2008). The second foundational premise (FP2) of SDL also implies the existing of a network orientation or actual networks when referring to the indirect exchange, both of which mask the nature of exchange (Vargo & Lusch, 2008).

The second foundational premise of the Lusch and Nambisan (2015) framework is resource liquefaction. Resource liquefaction plays an important role in a value network, allowing firms to separate information from its physical form through the ability to "separate, transport, and exchange information, apart from embodiment in goods and people" (Vargo & Lusch, 2008, p. 4). Resource liquefaction denotes the decoupling of information from the platform that stores, transmits, or processes it, while resource density refers to the ability to rapidly mobilize knowledge in the most effective and efficient manner (Lusch & Nambisan, 2015). Advances in IT have enabled resource liquefaction by allowing information that was physical embedded to be unbundled (Lusch

et al., 2010)—and, with digitization, such advances have facilitated firms' ability to share information even further (Lusch & Nambisan, 2015). When information is unbundled, it is easier to share information (Lusch & Nambisan, 2015), thereby making it easier for networks to adapt and respond to customer and market needs (Lusch et al., 2010).

The third premise is resource density, which is a critical element in the success of a value network (Lusch et al., 2010). Maximum density is achieved when a network adapts and mobilizes its resources in the most effective and efficient way (Lusch & Nambisan, 2015) in order to enhance its value proposition (Lusch et al., 2010). Resource density is correlated with resource liquefaction, such that an increase in resource liquefaction leads to higher resource density (Lusch et al., 2010).

Resource integration, the fourth foundational premise of Lusch and Nambisan (2015) framework, is part of the ninth foundational premise of SDL (FP9) (Lusch et al., 2010). The original premise of FP9 was the idea that all "all organizations exist to integrate and transform micro specialized competences into complex services that are demanded in the marketplace" (Lusch et al., 2010, p. 7). This premise was later modified to form what is known now as FP9: "all social and economic actors are resource integrators" (Lusch et al., 2010, p. 7). Some authors also use the term *service systems* to identify these social and economic actors (Lusch et al., 2010; Maglio et al., 2006). The concept of service systems has also been described as an arrangement of "people, technology, value propositions connecting internal and external service systems and shared information" (Vargo & Lusch, 2008, p. 5), implemented to facilitate an effort to co-create value (Maglio & Spohrer, 2008; Vargo & Lusch, 2008). Innovation is achieved by combining or bundling existing resources, and each new innovation becomes a module that can be combined with other resources to create another module (Lusch & Nambisan, 2015).

Lusch and Nambisan (2015) explain that, in order for service firms to stimulate service innovation, they have to concentrate on three core premises, based on the meta-theoretical foundations of SDL: service ecosystem, service platforms, and value co-creation. For Lusch and Nambisan (2015), service innovation emphasizes the value experienced by the

beneficiary, in which existing resources are repackaged to create new resources, in order to benefit various actors within the network. Innovation occurs when actors achieve maximum density, facilitating value co-creation—a process in which service platforms play a critical role supporting (Lusch & Nambisan, 2015).

II.3 Service Ecosystems

A service ecosystem is defined by Lusch and Nambisan (2015, p. 7) as "a relatively self-contained, self-adjusting system of mostly loosely coupled social and economic (resource-integrating) actors connected by shared institutional logics and mutual value co-creation through service exchange." A service ecosystem occurs when resource integration and service exchange take place among actors (Lusch & Nambisan, 2015). A service ecosystem has three major characteristics: structural flexibility and structural integrity, cognitive distance and a shared worldview, and the architecture of participation (Lusch & Nambisan, 2015).

The intricacies of virtual work arrangements, as described by Robey et al. (2003), are captured by the structural flexibility and integrity proposed by Lusch and Nambisan (2015). Social and economic actors in the service ecosystem are held together by structural integrity, which is formed by organizational competences, relationships, and information shared through common standards and protocols (Lusch et al., 2010).

Structural flexibility refers to the ways in which actors are organized to adapt to the environment and competitive pressures, while structural integrity refers to the relationships that hold diverse actors in a network (Lusch & Nambisan, 2015). Structural flexibility and structural integrity are both important; structural flexibility allows a business to maintain an agile structure, while structural integrity helps actors stay engaged and attached to one another (Lusch & Nambisan, 2015).

Lusch and Nambisan (2015, p. 11) describe a shared worldview as "the shared awareness that is critical for the ecosystem to capitalize on the synergies among the diverse set of

expertise and capabilities of the actors in the network." A shared worldview ensures a common understanding among actors who are cognitively distant from one another (Lusch & Nambisan, 2015). The role of IT in enabling a shared worldview is still a critical area for future research; specifically, there is a need to understand how IT can facilitate cognitive distant actors to come together and quickly integrate resources (Lusch & Nambisan, 2015).

The architecture of participation provides the blueprint for diverse actors to participate in service exchange (Lusch & Nambisan, 2015). Transparent rules of exchange and open business practices are significant characteristics necessary to facilitate coordination and interaction among actors (Lusch & Nambisan, 2015). A strong experience network is needed to enable personalization of the value co-creation experience. Specifically, the customer is put at the center of the value co-creation, and the firm and the customer subsequently co-discover new opportunities for value creation enabled by an experience network that facilitates personalized co-creation experiences (Prahalad & Ramaswamy, 2004c). Moving from a traditional, firm-centric supply and demand perspective to an effective experience network is not a change that can happen overnight. Instead, it is a process that happens in stages, through experimentation and knowledge learned from past attempts (Prahalad & Ramaswamy, 2004c).

Companies often make the mistake of designing products or services using a company-centric approach by thinking about the market segments they are going to target and the specific features they wish to add to a product or service. Rather than engaging the customer in value co-creation by fostering individual experiences, companies expect the customer to understand their language and systems, (Prahalad & Ramaswamy, 2004c). Personalized customer interaction requires an infrastructure in which suppliers, partners, and customer communities work as a network or ecosystem (Prahalad & Ramaswamy, 2004c).

Technology advancement has facilitated access to global knowledge networks (Prahalad & Ramaswamy, 2004c). For companies to compete, they need to involve an entire network, including suppliers, manufacturers, partners, and consumers (Prahalad & Ramaswamy,

2004c). Prahalad and Ramaswamy (2004c) accentuate the importance of having a strong network without internal or external boundaries. Internal boundaries are internal silos, known as "business units and financial groups." External boundaries are the hardest to break and exist between the firm and the customer.

II.4 Service Platforms

A service platform is the structure that assists in the collaboration between actors and resources, and it also serves as the venue for service innovation (Lusch & Nambisan, 2015). Lusch and Nambisan (2015) describe service platforms using two concepts: rules of exchange and modular architecture. Rules of exchange provide a set of rules regarding how actors should interact (Lusch & Nambisan, 2015). A layered-modular structure using IT enhances resource density and facilitates service exchange opportunities and value creation (Lusch and Nambisan (2015). Specifically, IT facilitates the founding of a value network, in which resources and knowledge are shared, fostering service innovation (Lusch & Nambisan, 2015). Table 5 summarizes these properties.

Table 5 - Key Aspects of Service Ecosystems and Service Platforms (Lusch & Nambisan, 2015)

	Definition
Structural Flexibility	Structural flexibility denotes the different forms in which actors can be organized to better suit innovation opportunities in a network. It implies the ease with which different configurations of actors (i.e., with regard to roles and responsibilities) can participate in the ecosystem to adapt to new environmental stimuli and competitive pressures and, in turn, create new service innovation opportunities.
Structural Integrity	Structural integrity refers to the nature of the ties or relationships that hold diverse actors together in a network.
Cognitive Distance	Cognitive distance refers to the differences in knowledge and skills of diverse actors in a network.
Shared Worldview	The concept of a shared worldview refers to the shared institutional logics that allow diverse actors who are cognitively distant from one another to obtain common perspective of their environment.
Architecture of Participation	The architecture of participation provides a roadmap for the different actors to come together and engage in service exchange. It also provides the mechanisms for participants' contributions to be coordinated, integrated, and synchronized in a coherent way.
Layered-Modular Architecture	A layered-modular structure is a hybrid between a modular architecture and a layered architecture. In a layered-modular architecture, the components represent a bundled set of specialized knowledge and skills, appearing in the form of tangible or intangible components that easily interface with heterogeneous product forms and types. A layered-modular architecture enhances the level of resource density.
Rules (Protocols) of Exchange	Protocols are the set of embedded rules that govern unstructured interactions in a service platform, controlling how actors should access resources and what types of service exchanges are valid.

II.5 Value Co-Creation

The literature on value creation and value co-creation is still limited. Under the traditional goods-centered dominant logic, value is determined by the producer and defined in terms of exchange value. In contrast, under SDL, value is perceived and determined by the customer on the basis of value-in-use (Vargo et al., 2008; Vargo & Lusch, 2004).

Grönroos and Voima (2013) conceptualize value creation and co-creation by focusing on the roles of the firm and the customer, in which the customer is the value creator, the firm is the value facilitator, and value co-creation is the function of the interaction between the firm and the customer. This perspective differs from the seventh foundational premise presented by Vargo and Lush (2004, 2008), in which they state that a firm alone cannot deliver value.

Grönroos and Voima (2013) explain the difficulty in studying value creation when roles and processes are not defined. They identify three value creation spheres to describe the role of the firm, the role of the customer, and their interaction. In the provider sphere, the provider produces resources and processes to be used in the customer's value creation and serves as the value facilitator by providing potential value-in-use (Grönroos & Voima, 2013). In the customer sphere, the customer creates value as value-in-use, independently of the provider, and no co-creation takes place (Grönroos & Voima, 2013). The interaction between the provider and the customer is defined as the joint sphere, and it is where the customer is the direct value creator, and value can be co-created when the firm is invited to be a part of this process (Grönroos & Voima, 2013).

Value creation is a dynamic process that is constantly evolving, based on past, present, and future customer experiences accumulated throughout the customer's value-creation process (Grönroos & Voima, 2013). The process of value co-creation drives innovation (Vargo et al., 2008).

Grönroos and Voima (2013) review three of the SDL foundational premises to enable value-creation analysis. In this research, I adopt the revised foundational premises listed in Table 6 in order to account for the different roles that the firm and the customer play in value creation and value co-creation.

Table 6 - Revised Foundational Premises (Grönroos & Voima, 2013)

FPs	Foundational Premise	Explanation
FP6	The customer is the value creator.	Customer's creation of value-in-use.
FP7a	By providing potential value, the firm is a facilitator of value for the customer.	When a firm operates in a closed environment and produces resources, these resources represent potential value for the customer.
FP7b	The firm is not restricted to making value propositions; instead, it also has the opportunity to directly and actively influence its customers' value creation as well.	Provided that the firm can engage with its customer's value-creating processes through direct interactions, it has the opportunity to co-create value jointly with them.
FP10	Value is accumulated throughout customers' value-creating processes. Value is always uniquely, both experientially and contextually, perceived and determined by the customer.	Experiences of value and the value creation process accumulate through a dynamic process with both creative and destructive phases.

The first meta-theoretical foundation of SDL, Actor-to-Actor Networks, suggests that "all actors are potential innovators or co-creators of value" (Lusch & Nambisan, 2015, p. 6)—a perspective that supports the revised foundations FP7a and FP7b.

In value co-creation, value is co-created between the firm and the customer, and the experience obtained from this interaction becomes the basis of value (Prahalad & Ramaswamy, 2004b). The process of co-creation allows firms' employees to have a better understanding of customer needs, motivations, and actions (Prahalad & Ramaswamy, 2004b). The customer and the firm co-create value together through a unique, personalized experience, characterized by the attempt to move away from what corporations call "best practices" and to focus more on the unique interaction between the firm and the consumer (Prahalad & Ramaswamy, 2004c).

In value co-creation, the company is not trying to target a customer, or to own the customer or the customer relationship. Instead, it is seeking to engage in a dialogue with the customer and to facilitate the co-creation of experiences (Prahalad & Ramaswamy, 2004c). The co-creation of value shifts the focus from the supply and demand of products and services to the experience environment as a whole, in which firms have to adjust to changes in consumer preferences and the personalization of co-creation experiences (Prahalad & Ramaswamy, 2004c). Co-creation cannot exist without constant collaboration within the network, which consists of the firm, suppliers, partners, customers, and customer communities (Prahalad & Ramaswamy, 2004c).

In summary, SDL is a well-established framework for studying service innovation. This research seeks to understand how the framework presented by Lush and Nambisan (Lusch & Nambisan, 2015) can be used as a theoretical lens to study how a service firm achieves value co-creation in service innovation.

II.6 Agile Distributed Development

Organizations that implement agile distributed development environments acknowledge the need to adopt distinct practices to compensate for the tensions that arise from blending agility with distributed development (Ramesh et al., 2006; Ramesh et al., 2012).

II.6.1 Challenges In Agile Distributed Development

Agile practices have historically been considered to be beneficial for small- to medium-sized projects, in which teams are small and customers are situated in the same location (Cao et al., 2004). When teams are distributed, implementing agile methodologies becomes more challenging (Layman et al., 2006). For large service organizations, integrating agile practices with existing processes requires additional attention (Lindvall et al., 2004). Global software development requires the flexibility provided by agile methods, as well as

the rigor required for distributed development (Holmström et al., 2006). Implementing agile methods with distributed teams poses several challenges. These challenges can be classified into three categories: communication, control, and trust (Ramesh et al., 2006; Ramesh et al., 2012). Communication challenges in agile distributed development pose several conflicting demands with regard to the formality of architectural design processes and knowledge sharing (Ramesh et al., 2006). Communication in distributed software development relies on formal mechanisms and presents challenges related to geographical separation (Ramesh et al., 2006; Ramesh et al., 2012). In contrast, communication in agile practices recognizes the need for face-to-face interactions between customers and the development team (Ramesh et al., 2006; Ramesh et al., 2012). Control in distributed development environments is achieved by establishing formal processes; on the other hand, agile development is based on informal processes that rely on people-oriented processes (Ramesh et al., 2006; Ramesh et al., 2012). Trust in distributed development lacks team cohesion and a shared view of goals, for which distributed teams rely on shared documentation (Ramesh et al., 2006; Ramesh et al., 2012). In contrast, trust in agile development demands team cohesion, with a strong emphasis on interpersonal relationships (Ramesh et al., 2006; Ramesh et al., 2012).

Some of the most significant challenges related to agile and distributed development are explained below:

I. Communication challenges in agile distributed development arise when agile practices are combined with distributed development (Layman et al., 2006; Ramesh et al., 2006). Agile development depends on enabling constant feedback through face-to-face interactions, rather than detailed processes, between team members and customers (Fowler & Highsmith, 2001; Highsmith & Cockburn, 2001). Distributed software development relies more on formal mechanisms, such as requirements documents (Ramesh et al., 2006). When working with teams that are not located in the same geographical location, face-to-face communications tend to be short, formal, selective, and sporadic (Oshri et al., 2007). Balancing formal communication with informal communication advocated by agile methods poses certain challenges (Ramesh et al., 2006).

II. Balancing the tensions between formal (i.e., process-oriented processes) and informal (i.e., people-oriented processes) control in agile distributed development is challenging (Holmström et al., 2006; Ramesh et al., 2012). Distributed development is achieved through the implementation of more established processes, while agile methods relies more on people-oriented processes, and control is achieved informally (Ramesh et al., 2006; Ramesh et al., 2012).

III. Determining the appropriate level of formality when developing contractual agreements is demanding in agile distributed development (Batra et al., 2010; Ramesh et al., 2006; Ramesh et al., 2012). In agile methods, contracts are lightly and casually defined (Ramesh et al., 2012), while, in distributed development, teams rely on detailed specifications of requirements (Ramesh et al., 2006; Ramesh et al., 2012).

IV. Managing the tension that exists between up-front and delayed commitments to requirements in agile distributed development is difficult (Ramesh et al., 2012). Distributed development calls for fixed, up-front commitments and well-defined expectations (Cao et al., 2004; Ramesh et al., 2012). Agile methods lack up-front designs and commitments (Cao et al., 2004) and rely more on ongoing negotiations between customers and developers (Ramesh et al., 2012).

V. In agile distributed development, finding the balance between specialized and integrated expertise presents certain challenges (Ramesh et al., 2012). Distributed development is usually organized based on the domain and technical expertise of specialized subgroups. For example, domain teams may be co-located with the customer, and teams with technical knowledge may be located offshore (Lagerling & Roman, 2005; Ramesh et al., 2012). In contrast, agile development teams are required to have both technical and domain knowledge for successful development (Lee & Xia, 2010; Ramesh et al., 2012).

VI. Achieving team cohesion in agile distributed teams is demanding (Ramesh et al., 2006; Ramesh et al., 2012). In distributed development, the development team and the customers are not co-located; thus, it is difficult to achieve team cohesion and a shared worldview (Ramesh et al., 2006; Ramesh et al., 2012). In agile development, teams are co-located, and it is easier to achieve team cohesion, build trust among team members, and develop strong interpersonal relationships (Ramesh et al., 2006; Ramesh et al., 2012).

II.6.2 Balanced Practices To Achieve Agile Distributed Development

The balanced practices that help to relieve the above tensions have been classified into four major groups, described below (Ramesh et al., 2012):

I. Formal structures, but with flexibility, comprise the first group of balanced practices, which are implemented when formality and flexibility are needed in a project (Ramesh et al., 2012). This group of balanced practices addresses two tensions: formal vs. informal communication and formal vs. informal control (Ramesh et al., 2012).

II. Process assimilation before the delivery of quick value represents the second group of balanced practices, which focus on developers gaining a thorough understanding of the business domain and user requirements. This group of balanced practices mitigates two conflicts: formal vs. informal communication and formal vs. informal contracts (Ramesh et al., 2006; Ramesh et al., 2012).

III. "Trust but verify" is the third group of balanced practices, which help to develop trust but also embrace the verification processes necessary to manage quality. This group of balanced practices assists with the following conflicts: upfront and delayed commitment, and formal vs. informal control (Ramesh et al., 2006; Ramesh et al., 2012).

IV. Cohesive but distributed project teams comprise the last group of balanced practices, which help to establish cohesiveness in agile distributed development. These practices address the following tensions: specialized vs. integrated expertise and dispersed vs. co-located teams (Ramesh et al., 2006; Ramesh et al., 2012).

A summary of these four groups of balanced practices is presented in Table 7.

Table 7 - Mapping Between Conflicts and Balanced Practices (Ramesh et al., 2012)

Conflicts in Agile Distributed Development	Balanced Practices
Formal vs. informal communication Formal vs. informal control	Formal Structures but with Flexibility a. Formal channels to facilitate informal communication b. Formal but limited coordination c. Plan iterations to finalize requirements and develop designs d. Document requirements at different levels of formality
Formal vs. informal communication Formal vs. informal contracts	Process Assimilation Before Delivering Quick Value a. Focus on well-understood functionalities, rather than on critical new functionalities b. Variable lengths, but short cycles
Formal vs. informal control Up-front vs. delayed commitment	Trust but Verify a. Trust in the development team, but management of quality b. Development through informal collaboration, but *post facto* documentation for verification
Specialized vs. integrated expertise Dispersed vs. collocated teams	Cohesive but Distributed Project Teams a. Synchronized work hours for relationship building b. Constant communication to establish team cohesion c. Facilitation of team cohesion through frequent visits d. Maintenance and nurturing of working relationships

III CHAPTER III: RESEARCH DESIGN AND METHODOLOGY

This research was designed as a qualitative study to study a relatively new phenomenon in depth (Myers, 2009). Qualitative research permits the researcher to understand people, their motivations and actions, and the contexts in which they work and live (Myers, 2009).

III.1 Research Method

This qualitative study adopted a case study design in an effort to improve our understanding of how value co-creation is implicated in service innovation when enabled by agile methods. Case studies are appropriate when the focus of the research is on understanding phenomena through the meanings that people assign to them, with a focus on the context of the phenomena (Myers, 2009). The case study approach has also been used to investigate contemporary organizational phenomena by asking a "how" question (Workman Jr, 1993; Yin, 2009). Benbasat et al. (1987) advocate the use of case studies in IS research, as this approach allows the researcher to study a phenomenon in its natural setting, collect the data by multiple means, and avoid using experimental controls or manipulation, to focus on contemporary events.

III.2 Philosophical Assumptions

The philosophical perspective of this research was critical realism (Myers, 2009; Myers & Klein, 2011; Wynn & Williams, 2012). According to Wynn and Williams (2012), critical realism is a research methodology that offers new opportunities for investigating complex organizational phenomena holistically. Critical realism allows researchers to identify how structural entities and contextual conditions interact to generate a particular array of events (Wynn & Williams, 2012). The main objective of critical realism is to offer well-defined, brief, and empirically supported statements about how and why a phenomenon transpired (Wynn & Williams, 2012).

This investigation followed a set of principles proposed by Wynn and Williams (2012) to enhance the quality of the critical realist case study. Table 8 provides a summary of these principles for conducting critical realist research (Wynn & Williams, 2012).

Table 8 - Summary of Principles for Conducting Critical Realist Research (Wynn & Williams, 2012)

Principles for Conducting Critical Realist Research
1. **Explication of Events** Identify and abstract the events being studied, usually from experiences, as a foundation for understanding what really happened in the underlying phenomena.
2. **Explication of Structure and Context** Identify the components of the social and physical structure, contextual environment, and the relationship between them (critically re-described from the actor's viewpoint in the theoretical perspective).
3. **Retroduction** Identify and elaborate on the powers/tendencies of the structure that may have interacted to generate the explicated events.
4. **Empirical Corroboration** Ensure that the proposed mechanisms have causal power, and that they have better explanatory power than alternatives.
5. **Triangulation and Multi-methods** Employ multiple approaches to support causal analysis based on a variety of data types and sources, analytical methods, investigators, and theories.

These principles are fundamental ideas supporting the undertaking and evaluation of critical realist research (Wynn & Williams, 2012). Our study followed the principle of the explication of events by identifying and explaining the events constituting the outcome of this study, allowing us to describe and explicate in detail the events believed to have actually occurred (Wynn & Williams, 2012). The research also followed the principle of the explication of the structure and context by identifying the components of the structure in an effort to understand its parts, such as the actors, rules, interactions, and relationships (Wynn & Williams, 2012). Furthermore, the principle of retroduction was applied in this research, as the researchers attempted to identify the most coherent explanation of the

observed events given specific conditions relative to the environment (Wynn & Williams, 2012). The principle of empirical corroboration helped us verify that the proposed mechanisms adequately represented the reality, but also had better explanatory power than alternative explanations (Wynn & Williams, 2012). Finally, the principle of triangulation and multi-methods strengthened this research by providing a control for the influence of various biases on the research process and the results generated by this process, when the reality comprised different structures and explanations (Wynn & Williams, 2012).

III.3 Case Study Design

This study was designed as an exploratory case study. An exploratory case study is used to discover and better understand a particular situation by asking "how" and "why" questions (Benbasat et al., 1987; Myers, 2009). Such research investigates phenomena within their real-life contexts (Myers, 2009). Benbasat et al. (1987) suggest that using case research is useful because of the ability of such research to integrate a study's organizational context with, in particular, the organizational contexts of studies in IS.

In this research, the unit of analysis is the service firm, and the units of observation are the senior and mid-level managers involved with the service innovation strategy.

III.3.1 Site Selection

One service firm in the U.S. (SERVICEINC) has been selected as a study site. Our single case study investigates a project called Project MAGENTA. SERVICEINC is a mature service organization with global operations in more than 50 countries supporting approximately 90 million customers. SERVICEINC offers a wide range of services through several distribution channels, all supported by numerous legacy systems. Improving customer service has been a top priority for the company for the last decade; unfortunately, it has been a complex and challenging task to accomplish. Project MAGENTA was selected for this project because of the impact this innovation project has had on the studied organization

and its customers. Project MAGENTA developed a software application that provides customer service representatives (CSRs) at a US call center and presents a consolidated view of clients' profiles across services and distribution channels. Project MAGENTA integrated data from over 70 legacy systems in just 90 days.

Before Project MAGENTA, over 1700 CSRs used to access several computer systems, sometimes using 15 screens that required more than 40 clicks, just to obtain the information necessary to service a client. These complex interactions made it hard for CSRs to create the client experience that SERVICEINC sought to achieve. Project MAGENTA simplified this process by providing a consolidated view of the client, in which accessing product and transaction information required only one click. SERVICEINC invested $300 million in Project MAGENTA, and it was the first innovation effort within the company to be implemented in just 90 days and to involve over 60 distributed departments working together as one team. Project MAGENTA used a new database system called MongoDB, which provides more flexibility, and scalability than the company's legacy systems.

This research focuses only on the initial innovation phase (i.e., the first 90 days) of Project MAGENTA, which took place in the US. Since the first 90 days, Project MAGENTA has been released in multiple countries, and it has served as the stepping-stone for further innovation efforts. Project MAGENTA has also received significant media coverage, not only in recognized technology innovation outlets, but also in major business and mainstream news outlets. In addition, SERVICEINC received a service innovation award in 2014 for Project MAGENTA.

The selection of the study site was driven by purposeful, theoretical sampling (Glaser & Strauss, 1967; Yin, 2009)—that is, the potential to investigate the IT-enabled service innovation through value co-creation. Theoretical sampling can help improve the external validity of case study research (Eisenhardt, 1989). Our selection of the chosen organization was driven by the following factors: i) The site offered a unique setting for understanding IT-enabled service innovation. It offered a theoretically relevant organizational context because of its long history of service innovations in an industry that faces tremendous

competitive challenges, as well as the difficulties it has faced in the marketplace due to novel services introduced by its competitors. ii) The site offered opportunities for disconfirming our expectations that the organization would be able to successfully develop service innovations because it had faced difficulties in meeting competitive challenges (Dube & Pare, 2003; Markus, 1989). iii) Finally, despite the past failures, the studied organization has been actively trying to foster IT-enabled service innovations by setting up a dedicated innovation center. These criteria ensured that our case study site provided a rich context for understanding and developing insights on the study phenomenon. Our objective was not to select a representative organization from which to generalize.

III.4 Data Collection

To better understand how service innovation is achieved through value co-creation when enabled by agile methods, this research followed Yin (2009) principles of data collection: 1) use multiple sources of evidence, 2) create a case study database, and 3) maintain a chain of evidence. These principles were followed in order to establish construct validity and reliability by ensuring quality control and making the process as explicit as possible (Yin, 2009).

III.4.1 Interviews

Data were collected through semi-structured interviews with a variety of stakeholders (i.e., customers and senior and middle managers). A total of 21 interviews were conducted on-site and over the phone. Table 9 includes information about the roles the interviewees played in Project MAGENTA.

Semi-structured interviews are commonly used in qualitative research to explore phenomena that are not well understood. Some aspects of the designs of such studies need to be flexible in that they allow for the addition, exclusion, and wording of particular interview questions. Participant responses influence how and which questions researchers

ask next. The design of semi-structured interviews is iterative in that the data collection and research questions are adjusted according to what is learned in the field (Corbin & Strauss, 1990, 2008; Eisenhardt, 1989).

The interviews lasted approximately one hour each. Written informed consent was obtained from all study participants prior to data collection. Follow-up questions were asked via phone or e-mail in order to gain further insights into the concepts that emerged from initial data analysis and/or when clarifications were needed.

All interviews were audio recorded and transcribed, with the permission of the participants being interviewed. The transcripts of the interviews constituted the primary data for this study.

Table 9 - Interviews Conducted with Project MAGENTA Stakeholders

Role Category	Role in Project
Database	Lead engineer for database servers
User Interface	Testing lead for user interface
Database	Data modeler
IT	CIO
IT	IT security liaisons
Developer	Lead developer, focus on party matching solution
Call Center	Assistant Vice President (VP) in call center—business liaison
User Interface	Assistant VP in UI development
IT	Lead project manager
IT	Director of IT project management
User Interface	Lead of UI development team
Project Manager	Project MAGENTA manager
Customer	Key business liaison (call center)
Liaison	Liaison for Project MAGENTA to source system development teams
Architect	Lead architect
Database	Director of data acquisition and analysis team
Call Center	PM for call center team
IT	VP of IT data teams
Technology	VP for technology team that supports US call center
Call Center	VP of call center team that implemented Project MAGENTA
Database	AVP of Application Development (AD) team responsible for developing Mongo Database loaders

III.4.2 Secondary Data

Secondary data, such as previously published online articles and internal publications, were used to provide additional insight into this research by facilitating data triangulation (Myers, 2009). Yin (2009) states that a case study is stronger and more precise when multiple sources of information are used.

III.5 Data Analysis

This research followed the data analysis procedures suggested by Miles and Huberman (1994), including data organization, data reduction, the drawing of conclusions, and verification. A case study database was developed to organize the interview transcripts and documents collected. The NVivo (Version 10.1.3) qualitative data analysis tool was used to code and categorize large amounts of narrative text that were collected from the interview transcripts.

The data were initially coded on the basis of the conceptual framework that served as the starting point of the analysis, and as the analysis progressed, more codes were added or existing ones were reviewed as new insights surfaced (Miles & Huberman, 1994). The codes chosen were semantically similar to what they represented, and the codes were reviewed until saturation was achieved (Miles & Huberman, 1994). The initial code list, presented in Appendix A, was constructed using descriptive codes (Miles & Huberman, 1994), following the framework presented by Lusch and Nambisan (2015). The initial round of coding revealed additional concepts relating to the service innovation elements described by Lusch and Nambisan (2015), which the initial codes did not cover. These concepts mostly reflected the tensions and challenges present in the service ecosystem and service platform. The next rounds of coding provided insights into the IS balanced practices and governance mechanisms presented in this study as a way to mitigate the tensions and address the challenges. The data reduction process was iterative, and every interview was coded and analyzed immediately after the data were collected..

IV CHAPTER IV: RESULTS

In this chapter, we present the empirical results of our study and describe how SERVICEINC co-created value with its customers. Our study revealed several tensions and challenges among the service innovation elements needed to co-create value. These tensions appeared within the service ecosystem in which Project MAGENTA's stakeholders—and, in particular, the development team and the customer—collaborated to create an environment suitable for value co-creation. The tensions described in this chapter existed between structural flexibility and structural integrity, between cognitive distance and a shared worldview, and within the constraints imposed on the architecture of participation. Additionally, several challenges emerged within the service platform that supported the interaction between the development team and its resources. This study also examines the practices that helped SERVICEINC mitigate these tensions, as well as the governance mechanisms that assisted the company in addressing relevant challenges, as illustrated in Figure 1. The ability of SERVICEINC to develop these practices and governance mechanisms created an environment in which the company was able to achieve value co-creation.

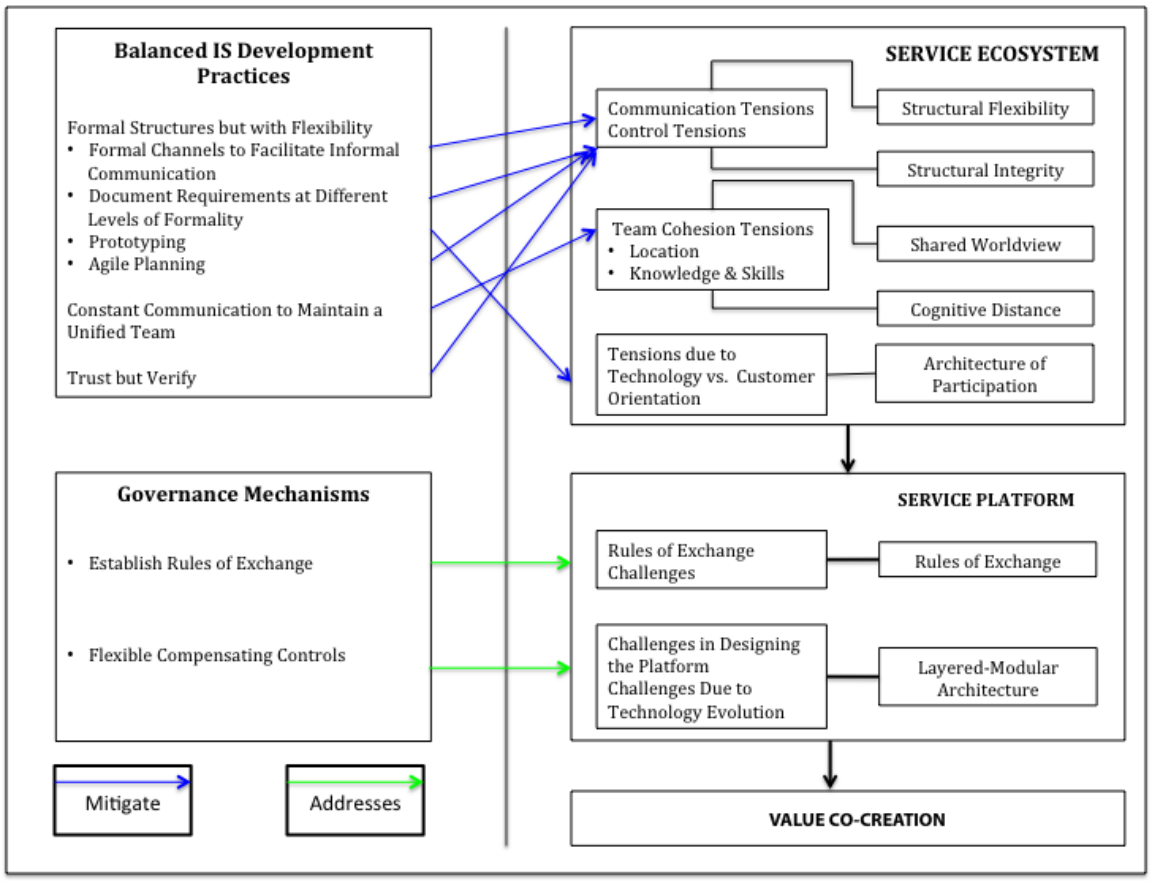

Figure 1 Service Innovation Framework

IV.1 Tensions

IV.1.1 Structural Flexibility and Structural Integrity

Achieving structural flexibility, while maintaining the structural integrity needed for an effective service ecosystem, created tensions across two dimensions: communication and control. Structural flexibility allowed the team to make quick adjustments based on evolving customer requirements and project needs, while structural integrity united the distributed development team and the customer within the network. We present each of

the tensions below:

IV.1.1.1 Communication Tensions

Whereas informal, face-to-face communication was more appropriate for facilitating agile development, in Project MAGENTA, we observed that formal, indirect communication was necessary because the development team and the customer were distributed across multiple geographic locations. The customer was distributed across Oklahoma, Rhode Island, and Ohio, while the development team was spread across Long Island, New Jersey, Pennsylvania, New York, and North Carolina. The communication between the development team and the customer required both formal and informal meetings, and the frequency of these meetings was based on the issues faced by both teams at various points during the development project. The assistant VP of the call center further explained:

> *There were formal meetings every day between these teams, and there were many, many, many informal meetings. So, for example, if an issue came up, then separate informal conversations would take place until the issue was resolved. These discussions will take place aside from the normal meetings already scheduled.*

The failure to co-locate the development team and the customer created communication barriers that required both teams to increase their collaborative frequency and intensity. The assistant VP in charge of user interface development described this situation as follows:

> *Customers were in lockstep with the developers. We met every day, three times a day. We were constantly talking to each other.*

Further, the development team and the customer were not accustomed to direct and frequent communication, since their typical communication was transactional, rather than collaborative. However, with Project MAGENTA, the situation was very different, as the lead of the user interface development team explained:

The customer was involved right along when we came up with the base-level requirement. We'd take those ideas and kind of put them up in storyboard-like formats and actually build the pseudo-versions of the application, and then come up with a user interface design right in line with that. So, it's new to what we've done in the past.

Project MAGENTA was considered a high-profile project; therefore, the executive team required constant updates about the project's progress. This created a need for formal documentation. However, at the same time, the rapid pace of development required the development team and the customer to interact informally. The project manager for Project MAGENTA further described:

Everybody was so enthralled in the deadline itself, and everybody was off running, doing stuff. A lot of the communication happened as kind of side conversations, but management felt very uncomfortable because they didn't feel like they knew the status of things at any given point in time.

IV.1.1.2 Control Tensions

The agile nature of Project MAGENTA required very informal processes and informal controls. However, for SERVICEINC, having formal controls in place to support a strategic and complex application like Project MAGENTA was important. These conflicting needs required the project to balance formal and informal controls, especially in terms of integrating the evolving customer requirements and achieving timely delivery of the final application. The lead of the user interface development team explained:

We usually go through a very formal and more structured iterative development process, where we define the requirements, and then we come up with actual implementation-type guides and documents, and then build from those. With Project

MAGENTA, it was challenging because a lot of the formal requirements had to be skipped, or we had to take pieces of the process. It was definitely a demanding process.

Project MAGENTA integrated new technology that had not gone through SERVICEINC's approval processes, which can take up to a year. Moreover, the project required flexible but formal controls in order to accommodate the aggressive timeline, as the CIO explained:

The process to approve new technology normally takes six months. Our standard processes here are very cumbersome and time-consuming. MongoDB was approved in five days, and it was certified as the project advanced.

IV.1.2 Cognitive Distance and Shared Worldview

In Project MAGENTA, achieving a shared worldview was necessary to facilitate a common perspective and shared goals; however, the nature of the development process necessitated distributed work. Obtaining a shared worldview is necessary for an effective service ecosystem. However, when team members are cognitively distant from one another, this process presents tensions related to achieving team cohesion.

IV.1.2.1 Team Cohesion Tensions

Achieving team cohesion was challenging for Project MAGENTA because the development team was not co-located and because there were limited opportunities for social interaction. In addition, achieving team cohesion was difficult due to the differences in knowledge and skills that existed among the different subgroups within the development team. When team members are cognitively distant from one another, it becomes challenging to obtain a common perspective in order to facilitate collaboration. Specifically, the development team had to bring together diverse groups (e.g., user interface design, infrastructure, and MongoDB groups) with different areas of technological expertise. The

reasons for team cohesion tensions are presented below:

IV.1.2.1.1 Location

In several instances, due to the distributed structure of SERVICEINC, members of the development team did not know whom to contact for information on specific systems. The lead project manager further explained his role:

> *I could really do whatever I felt was necessary. I got to basically go around the whole project to all the various technical teams on it. Because I understood the data, I could tell them how to better design their portions of the application. So, if you were to think of an IT project like a jigsaw puzzle, and you had different teams within each of the pieces, I was the guy that went around to each of the teams on the project and made sure that the pieces fit together at the end of the day.*

However, in Project MAGENTA, the development team was not co-located, leading to tensions related to achieving team cohesion and a shared view of the goals. The distributed nature of the development team made it difficult for team members to establish a shared understanding of the project requirements and priorities, as the director of IT project management explained:

> *It required us to almost think about it as sitting around the table and being in a think tank to solve world hunger. In a perfect world, you had time to develop a clear scope, to develop all the impacted teams, the roles and responsibilities, get a clear understanding, work out a timeline that's logical and realistic. None of that happened with this project.*

The liaison for Project MAGENTA further described the tension that existed among the development team members in their attempt to establish team cohesiveness:

> *It was difficult because there really weren't detailed business requirements. Architecture wanted all this information, and they didn't even know who to talk to, it was so many different groups. We didn't even know who owned some applications.*

IV.1.2.1.2 Differences in Knowledge and Skills

MongoDB was a new database system for SERVICEINC, and the integration of new technology with the company's existing technology required the sharing of technical knowledge that the development team did not already possess, as the assistant VP of the development team explained:

> *Most of the people that initially were working on Project MAGENTA learned MongoDB on their own. So, there was no formal training for that.*

The VP for technology further explained:

> *We were obviously under pretty heavy time constraints relative to production, and our folks had a lot of work to do to learn new technology. What I would say, though, is it was essentially an on-the-job type learning experience for our data guys.*

Due to the rapid way in which different technological components were brought together, there was a need to transfer technical knowledge across development team members. The lead of user interface development explained this challenge as follows:

In the past, we really had never done anything of this magnitude. So, we also didn't have experts when it came to user interface. We had to bring in very specific and specialized folks from that vendor.

IV.1.3 Architecture of Participation

The architecture of participation provided the roadmap for the development team and the customer to come together in a coordinated and integrated manner. The customer was interested in creating solutions that were critical to its operations. The development team, however, was initially focused on putting together a technological solution very quickly, as demanded by senior management. The need to bring together these two contradictory perspectives created tensions when the customer and the development team had to come together to develop a unified goal. These tensions are described in the sections below.

IV.1.3.1 Tensions Due To Technology versus Customer Orientation

At the very beginning of the project, the customer was not completely involved in the project, and the interaction between the development team and the customer was somewhat disengaged. The key business liaison explained this situation:

Well it was kind of a disconnect. When they brought me on to the project, it was just a request that said, 'We know you have some experience in writing requirements.' So, I wrote the business requirements, and I thought I was out of the project, but then the user interface design team started asking questions about it, and I became part of the team. That was probably the most disconnected piece of the process.

Project MAGENTA started as a technology-driven project designed to aggregate, consolidate and simplify data. The development team had a mandate from the executive team to create a solution capable of amalgamating dozens of administrative systems into a

single application to provide CSRs with a single view of the client. The VP for the technology team described:

> *We identified pretty early the business opportunity to use this new technology. We wanted to focus on improving the productivity and efficiency of the actual call representative. We really focused on two main things, the first being knowing a client better. So, what products, and what does the relationship with SERVICEINC look like? That was consistent from very early on. And then the other would be: Why might the client be calling, from the standpoint of transactions or interactions that we've had that with that client fairly recently? We have a new technology out there and have the ability to do some things that haven't really been done before, and how could we use them in the call center to improve in that space?*

The client was interested in the application and in the ease with which CSRs were able to access client and product information, which would allow the company to better service its clients. The development team, however, though it had a good understanding of the technological issues associated with managing data, did not have a good understanding of critical stakeholders' intended uses of these data. The VP of the call center explained this tension:

> *The complexity came to be is having those specific IT teams behind those products who knew and understood the data better than we did. We deal with the data on a regular basis, but we deal with it from an application exposure perspective. We really don't see it or deal with it from any back-end view. We're not product experts from the back-end perspective, nor are we application system experts when it comes to the use of the platform. We're purely the users—you know, attempting to view that content to serve a customer.*

The development team and the customer needed to find a way to create mechanisms with which they could collaborate with each other, as described by the VP of the call center:

The development team and the customer team needed to break down the disconnects and build the bridge between those groups to make it very simple and easy and accessible to kind of traverse that bridge and build a better project overall.

IV.2 Challenges

IV.2.1 Layered Modular Architecture

The layered modular architecture provides the structure that helps to maximize service innovation by enhancing the configuration and design of the service platform. For SERVICEINC, however, planning and designing such an architecture, while operating under an aggressive timeline for Project MAGENTA, was challenging. In addition, the development team faced challenges due to the changes to the architecture necessitated by the evolving technology of MongoDB. The two challenges that Project MAGENTA had to overcome at the service platform level are described in more detail below.

IV.2.1.1 Challenges in Designing The Platform

Due to the aggressive timeline set for Project MAGENTA, SERVICEINC was pressed to rapidly design and develop its technology platform. The development team required a clear understanding of all the guidelines or standards that had to be satisfied by the architectural design of the service platform. For example, it was necessary to consider the need to structure and protect the data in MongoDB, as well as to gain deeper knowledge into how the application and queries were going to use MongoDB. The data modeler explained:

A variety of ongoing challenges surfaced due to the timeline and new technology. We needed time to understand all the relationships within those entities, and then build a dictionary of all the data fields that need to exist in those entities. This took time. We couldn't have 20, 30 different systems or more all writing information into the same

place and using the fields consistently and properly unless everybody understands the definition of every field and everybody's speaking the same language.

In addition, the use of MongoDB required additional architectural elements, beyond those required for the use of relational database design. However, the aggressive timeline of Project MAGENTA did not allow for such a careful design of the platform, as explained by the data modeler:

MongoDB, because it's document-oriented design and not relational, needed to have extra steps. These extra processes confronted ongoing time schedule challenges.

Further, any delays caused by the time taken to develop an appropriate design for the platform were deemed a major challenge to the primary goal of the project: namely, delivering the application within the 90-day time frame stipulated by senior management. The testing lead for the user interface design described this challenge:

Given the project had a certain end date to be delivered—and, a lot of times, the application development team was not delivering on time—the squeeze came back on the testing, and sometimes the team in charge of delivering the code has told us it will be delivered on such and such date, but then, the code delivery is delayed for whatever reason. So, code delivery and the time squeeze created challenges because we still have to stay within the timeline. Nobody was extending the timeline if quality assurance testing was not done.

IV.2.1.2 Challenges Due To Technology Evolution

The evolving nature of the technology that formed the basis of Project MAGENTA as the project was unfolding posed significant challenges with regard to the development of the service platform. MongoDB, which formed the central component of the platform, was,

itself, being built incrementally, even as it was being used by Project MAGENTA. The IT security liaison noted:

> *Project MAGENTA was using a new database—it's called MongoDB—and there were no guidelines or standards for how to use MongoDB and protect the data within it.*

SERVICEINC was, indeed, the first major client of MongoDB, as the SERVICEINC CIO described:

> *We were the number one client of theirs. We're the ones that put them on the map.*

In addition, the architecture of MongoDB was new, and there were no standards to follow, as the lead engineer for database servers illustrated:

> *There was no existing architecture for MongoDB. This was new.*

Thus, the major component of the platform architecture was undergoing its own changes as the development of the application was unfolding.

IV.2.2 Rules of Exchange

Rules of exchange offered embedded guidelines that controlled how actors accessed resources and what types of service exchanges were allowed. When rules of exchange are well defined, the integration of various components is faster and more effective. Well-defined rules of exchange are critical for service creation. In Project MAGENTA, it was difficult to specify the rules of exchange between the various groups involved in development. For example, several teams had access to the underlying customer data. At the outset, there were no clear guidelines on which components of the system would have the rights to only access (but not modify) the data, and which ones would have complete control over all aspects of managing the data. This challenge was more pronounced

because the database architecture of MongoDB itself was evolving. The VP of the call center team described:

> *We have to deal with the differentiation for system access and accessing the customer information and all the sensitivity that goes along with that. The kind of the gatekeeping of that has always been at the application layer. So, that problem handled by that separation of admin system was completely turned on its head when you talk about now aggregating content across products for a common user and what that did was eliminate or remove the separation associated with each application that supported a given product. So, you now basically stripped all that away and we're left with how will you define whether or not access is necessary, and all the different rules and regulations that are involved.*

The lead project manager further explained:

> *One of the challenges that we faced in this space is that we needed to be very conservative about ensuring that we're only showing data to someone who has the authority to access it.*

In summary, Project MAGENTA faced several tensions in creating its ecosystem and several challenges in creating its service platform, both of which were essential for achieving value co-creation. The development team created several practices and governance mechanisms to mitigate the tensions and address the challenges described above. The practices and governance mechanisms that SERVICEINC created are described below.

IV.3 Balanced Is Development Practices

SERVICEINC adopted the following balanced IS practices to help mitigate the tensions in the service ecosystem. The practices described in this section are drawn from agile development methods, but have been adapted to meet the demands of the distributed

nature of the development team and the customer. The observed IS development practices are presented below:

IV.3.1 Formal Structure With Flexibility

SERVICEINC adopted the following practices to balance the formality and flexibility needed in Project MAGENTA.

IV.3.1.1 Formal Channels To Facilitate Informal Communication

The agile nature of Project MAGENTA relied heavily on informal communication to facilitate interaction among the various groups in the development team, as well as between the development team and the customer, as much as possible. However, since the project was operating under a tight deadline, and since the development team and customers were widely distributed, Project MAGENTA created various formal structures to channel informal communication.

Project MAGENTA involved so many different actors and was moving so quickly that it was necessary to assign a lead project manager as the primary contact for channeling communication. This project manager had a more detailed understanding of the entire project, as well as a good understanding of the data, team assignments, and project status, and had the freedom to do whatever was necessary to successfully move the project forward. When informal exchanges were channeled through such an important member of the development team, project team members felt more comfortable relying on the information exchange, while focusing on making important changes to critical aspects of the system.

However, the development process also accommodated informal interactions between the customer and the development team on issues that were time sensitive and non-critical. The lead project manager described such interactions, which happened frequently:

> *I met with the customer on a daily basis. We worked with various teams with the customer, multiple times throughout the day. We had standing meetings at 8 a.m. in the morning and then, you know, ad hoc conversations as needed throughout the day. The teams that the customer interfaced with behind the scenes—that really became on an as-needed basis. So, when we got to certain milestones in the project, being able to visualize and render certain functionality—that would be taken back to the customer's team, but that was not on a predefined schedule.*

Thus, the development process accommodated informal communication, but also provided a structure within which such communication could be channeled to facilitate efficiency and timeliness on important issues.

IV.3.1.2 Document Requirements At Different Levels Of Formality

The documentation of requirements at different levels of formality was necessary to gain approval for the work undertaken by the development team and the customer with regard to critical requirements, while, at the same time, providing the flexibility to move forward without being constrained by the need for documentation or formal approvals for other requirements. Simple requirements could be handled with customer input, without any detailed explanations. However, for critical requirements, proposed changes had to pass through various approval channels before they could be implemented. Some critical requirements and design decisions were specified and documented in detail, whereas simple requirements and designs were not. The testing lead for the user interface explained:

> *Usually, in a waterfall, you need to have a functional requirement document, and then we go to this document to be able to test it. With Project MAGENTA, there were no big, fat, functional requirement documents. It is like small chunks of deliverables—we had to be more flexible when writing our test cases. For example, in one sprint, you are just getting the user logon screen, and maybe it's just validating that the user ID has to be entered and a password has to be entered. So, our test cases are going to test how many valid combinations I can have for user ID. If it's alphanumeric, if it's a numeric, I have to do that kind of a test. I'm not going to go to the next screen because that's end of scope now. The next screen is not developed until the next sprint.*

A data modeler provided an example of a critical requirement that needed a formal structure. The data structures used for managing data had to be carefully defined and approved:

> *We built clear data element names in English and abbreviated them using SERVICEINC standard abbreviations for the fields that were physically stored in MongoDB. So, now we have an English term for the first name and an abbreviation of that—'FRST_NM'—and everybody writing to MongoDB is going to write it as 'FRST_NM.'*

In contrast, for simple requirements, only customer input (i.e., without exhaustive explanations) was necessary. The project manager for the call center explained further:

> *Normally, for a functional requirement, a lot of documentation was needed. For Project MAGENTA, some customer requirements were documented in a different way and kind of on the fly, so we could get through the process more quickly.*

IV.3.1.3 Prototyping

Prototyping is a way for the developer and the customer to articulate system requirements. For the developer, prototyping is useful for understanding what the customer needs, as it

enables the customer to better describe what he or she really wants. For the customer, prototyping assists in the visualization of the development team's implementation of requirements, as well as in the provision of feedback.

Prototyping helps the development team and the customer engage in frequent communication and aids in the articulation of system requirements. Since Project MAGENTA required frequent communication to understand the evolving requirements of the customer, the development team quickly built a prototype to serve as the medium through which the two parties could communicate effectively. Since the development team and the customer did not possess the same levels of technical or business domain knowledge, it was easier for them to achieve a common understanding through frequent and focused communication through the use of a prototype.

The prototype was also designed to provide the look and feel of Facebook so that the CSRs could easily relate to its functionality. The lead project manager explained:

> *Project MAGENTA was born from a prototype. The development team quickly put together a few screens that the customer could interact with. So, we started with that as a point A, and then we worked forward from there. Some of the things that were there in concept were not technologically possible on day one, and other things—the way that we had organized the data or suggested that, you know, certain information be brought in—either wasn't necessary or it could be cleaned up.*

The CIO further explained how prototyping helped, not only the development team and the customer in achieving a mutual understanding, but also assisted the CIO in articulating the business needs described by the CEO and his executive team and facilitating the conversation between them:

We engaged a company that helped us create a prototype in less than three weeks that worked with simulated customer data, looked like Facebook, and we then took that prototype and socialized it with the businesses to say, 'Do we need this?' 'Should we invest in this?' 'Is this something that you want?'

The VP of the call center team further explained:

We created a walk around the prototype, and took that prototype and we walked around to various areas to kind of gauge interest. We did some presentations for executives on the IT side and on the business side to gauge whether they wanted to do something like Project MAGENTA.

IV.3.1.4 Agile Planning

Project MAGENTA created procedures for planning and approving changes that were designed to accommodate the agile nature of development, while, at the same time, ensuring that mechanisms were in place for the careful review and approval of changes to critical and strategic aspects of the project. For example, MongoDB was not yet approved for use at SERVICEINC when Project MAGENTA launched. The standard processes at SERVICEINC are cumbersome and time consuming, and approval processes often took up to a year. Therefore an alternative approval process was followed for MongoDB to accommodate the agile nature of Project MAGENTA, while ensuring appropriate compliance processes were in place. The CIO described this process:

From an architecture side, MongoDB was not approved for use yet in SERVICEINC. Typically, the process could take a year or so to get approved, easily. So, working with

my peer who runs architecture and infrastructure, he basically told his team, 'Work parallel to us. Let us go, and actually, we'll certify it as we go.' So, he changed his practice. He provisioned in five days things that would normally take six months.

IV.3.2 Constant Communication To Maintain A Unified Team

SERVICEINC acknowledged the need to bring together the diverse groups that comprised the development team in order to create a more unified structure. The development team included: user interface developers, architects, data modelers, and vendors. A unified development team was created and nurtured through constant communication among these sub-groups. This communication focused on critical aspects of the project, such as the identification of important issues, the provision of project statuses, and the improvement of teamwork. A variety of mechanisms, such as WebEx and Whiteboarding, were used to maintain constant communication. The lead architect explained:

We met every day as a large team in the morning, 8 a.m., to talk about: How are we going to start our day? Who's worked on what? What needed to be delivered? What are the major risks that we're facing? Meanwhile, there would be kind of specific teams who were meeting throughout the day. For example, for the data integration piece, many meetings would start at three and end at six or seven at night, and we would be on the WebEx or Whiteboarding on a video. We would be assigning takeaways, and then we would regroup again the next day, kind of on the same topic. 'Let's meet, you know, once or twice a week with the senior leadership group to kind of update them and get them to help remove the roadblocks that we have,' and that kind of thing.

The lead data modeler also described this practice:

Meetings often involved a variety of participants: application developers, you know; user interface developers; architects; database and data modeling. Discussions included a variety of ongoing challenges, including new data requirements, new

application requirements, new process requirements. Meetings were pretty much daily. Sometimes they were in the morning, you know, multiple meetings daily—morning through night.

IV.3.3 Trust, But Verify

Informal controls satisfied the agile nature of Project MAGENTA, but formal processes were introduced by SERVICEINC to maintain the quality of such a complex application. Thus, trust was developed between the development team and the customer through informal collaboration, but formal processes were adopted to verify the timely delivery of evolving customer requirements.

Project MAGENTA required an informal atmosphere with formal processes in order to facilitate collaboration between the development team and the customer. The development team and the customer interacted on a daily basis, reviewing system features and prioritizing tasks. The VP of the call center explained this process:

We created the requirements documents with the customer rather rapidly. I think, you know, a lot of the challenge was how to keep it as simple as possible, and the most important thing was to get it to do all the products that the customer has, which was also known as our policy diary. We went through our cycles of complexity and simplification as we went through that requirements-gathering process.

IV.4 Mitigating Tensions With Balanced Practices

A formal structure with flexibility mitigates three groups of tensions: communication, control, and technology versus customer orientation. Rather than relying only on informal communication, which is common practice in agile development, Project MAGENTA also

used formal communication to meet the need for compliance with SERVICEINC's organizational norms. By selectively augmenting informal communication with formal mechanisms, the project was able to mitigate communication tensions. For a critical application like Project MAGENTA, seeking approvals through an organizational hierarchy for certain critical aspects of the project, while maintaining the flexibility to implement other aspects of the project informally, was a way to mitigate control tensions. With regard to the technology versus customer orientation tension, balance was achieved through prototyping. This practice facilitated an improved understanding between the development team and the customer. Specifically, the use of a prototype helped the development team develop a deeper understanding of the customer requirements—and, thus, exploit the functionalities of a technology platform that could support these requirements. Similarly, frequent and intense interactions with the development team concerning the capabilities implemented in the prototype helped the customer understand, not only the technology's capabilities, but also its constraints. Thus, both groups of stakeholders were able to develop a deeper understanding of the other's perspective and to work toward developing a system that exploited technology, while maintaining a clear focus on customer needs. The frequency of communication facilitated by the use of the prototype also helped to mitigate the tensions involved in achieving effective communication. In particular, agile planning helped to mitigate control tensions by providing the flexibility and structure essential to Project MAGENTA. It helped the development team maintain some control over the critical aspects of development, but without unduly slowing down the development process. Moreover, constant communication helped to mitigate team cohesion tensions by minimizing the impact of the development team's distribution and cognitive distance, thereby facilitating the maintenance of a unified team. Specifically, constant communication provided the development team with social interaction opportunities, allowing team members to collaborate and obtain a mutual understanding. Developing informal collaborations, but then documenting the agreed-upon action steps for verification, helped to address control issues. Project MAGENTA required flexible verification processes to address both the evolving customer feedback and the aggressive timeline.

IV.5 Governance Mechanisms

SERVICEINC adopted the following governance mechanisms to help address the challenges inherent in the development of the service platform. The governance mechanisms presented in this section are drawn from agile development methods, but have been adapted to address the distributed nature of the development team and the customer. The governance mechanisms observed in this study are illustrated below:

IV.5.1 Flexible Compensating Controls

The development team was given the flexibility to implement control mechanisms when appropriate, but was instructed to do so without unduly constraining development. Project MAGENTA adopted a standard platform to provide the team with the flexibility to proceed with development quickly. However, when the chosen platform did not offer adequate controls, the organization implemented its own control mechanisms to compensate. For example, Project MAGENTA had to use alternative security methods to protect its data as a way to offset the lack of security standards for MongoDB. The IT security liaison described this mitigating practice:

> *MongoDB was essential at the time, and our current version was still without security. We came up with a bunch of compensating controls that allowed us to protect the data, but in an alternate manner than we would prefer to protect it, and employ database monitoring as well. We put encryption controls that didn't exist before. We put in a number of processes that ran against the database to check access and who had access and to make sure that authorization was turned on.*

The lead developer further described the flexible compensating controls that were implemented in Project MAGENTA to provide protection for the data stored in MongoDB:

So, it was a different way of dealing with a database, where we may not get the same (without protection and transaction requirements) as an SQL server, which we felt was a noteworthy risk to take. But we still had to figure out: How do we take that risk, and how do we make sure we don't shoot ourselves in the foot?

The selected technology platform required flexible compensating controls to address the challenges faced when designing the platform. Some of the challenges were actually addresses by the flexibility of the database. MongoDB uses a data format called JSON, and the development of the platform required the implementation of new processes and mechanisms. For example, any time the flow of how data was inserted and decoded changed, the developer making the change was responsible for notifying the impacted teams, as explained by the lead project manager:

One of the benefits of MongoDB is that it was flexible, but the teams that actually inserted data into MongoDB, decoded it and provided it to data providers. Anytime anything within that flow would change, either the developer responsible or the developer and the architect, will need to make sure they understand what the change was and notify the other impacted teams.

Designing the platform required a lot of changes that were quickly handled by the flexibility MongoDB provided. The team developed a design that handles changes quickly and easily. The data modeler further explained:

The high level document-oriented design document (JSON), allowed us to make high level changes, very quick and easy. The JSON document has the detailed data that tend to come from the business and the application, and technical data requirements that came from the architecture and development teams.

IV.5.2 Establish Rules Of Exchange

The rules of exchange created embedded guidelines that controlled how actors accessed resources and established norms for the types of service exchanges that were allowed. Project MAGENTA established specific rules of exchange for managing data, since several teams were accessing the data at the same time. For example, the CSRs were not allowed to make changes to customer data. When CSRs identified an error within a client record, they were required to report it to the help desk. The only group that was permitted to modify the data was the research team, which was responsible for verifying the requests made by other teams, such as CSRs.
The CIO described:

> *We created a data quality system where the customer could notify us of a data quality issue and the research team will research it and make the correction. The research team fixed 3.2 million policies.*

The assistant VP of the application development further illustrated:

> *We established rules in place for making the adjustments to the data, and data adjustments would just float up to Project MAGENTA, so the data was being continually improved.*

IV.6 Addressing Challenges With Governance Mechanisms

The establishment of flexible compensating controls facilitated the creation of alternative processes when formal standards were not available, thereby addressing tensions related to the layered modular architecture. Design and planning challenges, as well as technology evolution challenges, were addressed through flexible compensating controls. These provided the flexibility to implement control mechanisms when appropriate, but without excessively restricting development (given the project's aggressive timeline).

Well-defined rules of exchange facilitated service creation by allowing faster and more efficient component integration. Our findings revealed that establishing clear rules of exchange facilitated coordination among the various stakeholders involved in the creation of the service platform.

V CHAPTER V: DISCUSSION

This dissertation was motivated by the lack of understanding of how IT-enabled service innovation is achieved. The investigation of a large service organization highlighted balanced IS development practices and governance mechanisms that fostered a service ecosystem and service platform that enabled value co-creation. This study contributes to the service innovation literature by identifying several tensions inherent in the creation of the service ecosystem, as well as several challenges involved in the creation of a service platform. It also adds to the service innovation literature by identifying both the practices that mitigate these tensions and the governance mechanisms that can address these challenges. Thus, the study provides a nuanced understanding of how service innovations can be accomplished. Finally, as the first study to explore the role of agile distributed development in the context of value co-creation, the findings of the present study contribute to the agile development literature. The past research on agile development and value co-creation is fragmented. The present study integrates the two literature streams by articulating the role of agile distributed practices in facilitating value co-creation and enabling the development of effective service ecosystems and service platforms. Specifically, it presents a framework (Figure 1) that maps the tensions and challenges that exist within the service innovation elements of agile distributed practices. In order to achieve value co-creation, it was necessary for SERVICEINC to adopt several practices drawn from agile development. Thus, this research makes important contributions to both knowledge and practice (Van de Ven, 2007) with regard to how a service organization achieves service innovation through value co-creation enabled by agile distributed practices.

This section details the study's contributions to theory and practice, discusses the research limitations, and outlines future research opportunities.

V.1.1 Theoretical Contribution

This study has significant theoretical implications. First, it extends the service innovation literature by identifying the tensions intrinsic to the service ecosystem, and the challenges

involved in designing a service platform for enabling value co-creation. The service innovation elements presented by Lusch and Nambisan (2015) acknowledge the need to solve various potential conflicts that may surface within some of these elements; however, they do not provide insight into how such solutions may be achieved. The present study articulates the tensions and challenges inherent in service ecosystems and service platforms and highlights the importance of addressing them before value can be co-created.

Moreover, this study extends Lusch and Nambisan's (2015) argument that structural flexibility and structural integrity may potentially conflict with one another. Lusch and Nambisan (2015) recognize the need for additional research to help mediate the resulting tensions; however, they do not describe the tensions in detail, nor do they suggest any mitigating practices. The present research, in contrast, identifies and articulates two tensions between structural flexibility and structural integrity: specifically, communication and control tensions. In regard to communication tensions, the firm and the customer must interact in order for value co-creation to take place (Grönroos & Voima, 2013), and this interaction needs to be of quality in order for the firm to positively influence the customer's value creation process (Grönroos & Voima, 2013). The occurrence of communication tensions between structural flexibility and structural integrity places a burden on the value co-creation process. Identifying and articulating the communication tensions between structural flexibility and structural integrity thus enriches the existing understanding of service innovation. Communication between all actors is necessary to co-create value (Lusch & Vargo, 2006). Communication is part of the SDL foundation, which focuses on the process of identifying customer needs through conversation and dialogue (Lusch & Vargo, 2006). Value co-creation has an interactive and networked nature (Vargo & Lusch, 2008) that is influenced by the customer and the firm (Grönroos & Voima, 2013). However, the control tensions that emerge due to the need to have flexible but formal controls has not been explored under SDL. Grönroos and Voima (2013) acknowledge that the firm exerts control in the value co-creation process by directly influencing the customer's value creation. The direct influence on the customer's value creation process, however, leaves some room for potential conflicts, which this research identifies and explains. Vargo and Lusch (2008) imply that the firm has no control at all in the value co-creation process,

because the customer is always the co-creator of the value. By identifying the control tensions between the two service innovation elements—structural flexibility and structural integrity—this study advances the understanding of the value co-creation process, where value co-creation is a function of the interaction between the firm and the customer. The structural integrity provides the structure that the actors need to stay connected and engaged, while the structural flexibility gives the actors the necessary adaptability to respond to competitive pressures and to innovate (Lusch & Nambisan, 2015). Thus, grasping the communication and control tensions between these two service innovation elements extends our current understanding of these two service innovation elements.

Achieving a shared worldview when the actors are cognitively distant creates team cohesion tensions not identified by Lusch and Nambisan (2015). Chandler and Lusch (2015) briefly describe the need to understand group cohesion from a service systems perspective, where actors and technology become connected and evolve together. The cognitive distance between the actors is a source of innovative ideas (Lusch & Spohrer, 2012), while a lack of cognitive distance between the actors due to an insufficient diversity of knowledge and skills tampers with the team's ability to innovate (Lehrer et al., 2012). Increasing the specialization among the actors, which widens the cognitive distance between the actors, drives the development of differentiated capabilities within the service ecosystem (Tiwana et al., 2010). Due to the diverse locations of the team members, and their differences in terms of knowledge and skills, achieving a shared worldview when the development team members are cognitively distant creates tensions related to team cohesion. These tensions were not identified by Lusch and Nambisan (2015). Therefore, the present study constitutes an attempt to expand the current understanding of service innovation by describing the team cohesion tensions present when the team members attempt to achieve a shared worldview with those who are cognitively distant, to achieve value co-creation.

Bringing together two distinct perspectives—specifically, the customer and the development team perspectives—can lead to the specification of a unified objective in the tensions created in the service ecosystem. This research reveals that the interaction

between the development team and the customer, which is necessary for value co-creation, is a radical step into the unknown (Sanders & Stappers, 2008), especially for a large service firm, where the development team experienced difficulties because their understanding of the customer was based on a technology point of view, across a wide range of service offerings (Varma, 2012), and the customer's perspective was based on the understanding of the application of experimentation and knowledge acquired from previous experiences (Prahalad & Ramaswamy, 2004a). Lusch and Nambisan (2015) describe the architecture of participation as a roadmap for different actors to come together in a coordinated, integrated, and synchronized manner. However, Lusch and Nambisan (2015) do not acknowledge the presence of tensions within the architecture of participation. The present study describes the tensions resulting from technology and customer orientation, which one must understand in order to mitigate them and develop a unified understanding of how value co-creation takes place.

The present study also demonstrates how challenges emerge within a service platform. This acknowledgement is especially important because the service platform provides a structure that not only supports the collaboration between actors and resources but also serves as a venue for service innovation (Lusch & Nambisan, 2015). According to this research, Project MAGENTA faced challenges that needed to be addressed before value co-creation could be achieved. The two service innovation elements of the service platform (i.e., the rules of exchange and the layered modular architecture) experienced the following challenges: rules of exchange, design and planning, and technology evolution challenges. Rules of exchange play a crucial role in validating the interactions between actors and resources (Lusch & Nambisan, 2015), but establishing these rules of exchange is difficult and presents some challenges, as we observed in this study. Tiwana et al. (2010) emphasize the need to establish software-based platform rules that are versatile enough to give some freedom to developers, but also stable enough to constrain the developers. Lusch and Nambisan (2015) do not describe the challenges of the rules of exchange, but the present research does.

This research also demonstrates that achieving a layered-modular architecture can present challenges in designing the service platform and challenges due to the changes in the architecture demanded by the evolving technology. Lusch and Nambisan (2015) describe the need for a layered-modular architecture to maximize value co-creation opportunities. Designing a layered-modular architecture using IT enhances the resource density and enables service exchange opportunities and value creation (Lusch & Nambisan, 2015). Moreover, a layered-modular architecture has the potential to help firms innovate (Yoo et al., 2010). However, this research identifies challenges that must be addressed in order to enable a service platform capable of supporting value co-creation. The insights gleaned from this study deepen the understanding of service innovation, which is necessary for designing and developing a service platform that can enable value co-creation.

This study also contributes to the service innovation literature by identifying several practices that mitigate tensions, as well as several governance mechanisms that address the challenges involved in facilitating value co-creation. Specifically, each tension and challenge is mapped to its respective, balanced IS development practice and governance mechanism. In particular, the present study uncovers three balanced IS development practices: formal structures with flexibility, constant communication to maintain a unified development team, and trust developed through informal collaboration. Furthermore, the study identifies four formal structures with flexible sub-practices: formal channels to facilitate informal communication, document requirements at different levels of formality, prototyping, and agile planning. The governance mechanisms documented in this research are the rules of exchange and flexible compensating controls. Figure 1 presents a service innovation framework illustrating the tensions and challenges and their respective mappings to the relevant balanced IS development practice or governance mechanism.

Significantly, the adapted service innovation framework acknowledges the tensions and challenges that must be mitigated and addressed before value is co-created. In this research, we observed that the original foundational premises of SDL (Vargo & Lusch, 2006; Vargo & Lusch, 2004, 2008) and the revised SDL foundational premises (Grönroos & Voima, 2013), when applied to a large service organization, represent an ideal—something

that is achieved after the tensions are mitigated and the challenges are addressed. The foundational premise FP8 portrays a service with a customer-oriented view (Vargo & Lusch, 2008), which is the basis of Project MAGENTA. The foundational premise FP1 portrays a service as the basis of all exchanges (Vargo & Lusch, 2004, 2008). Our results suggest that knowledge and skills are the fundamental units of exchange (Vargo & Lusch, 2004). Moreover, this perspective of exchange is supported by the foundational premise FP2, in which the indirect exchange of skills is characteristic of large, hierarchical organizations (Vargo & Akaka, 2009; Vargo & Lusch, 2008). In addition, this study supports the foundational premise FP9, where the actors involved in the exchange are resource integrators (Vargo & Lusch, 2008).

However, this research also suggests that these foundational premises apply only once the tensions have been mitigated. The foundational premise FP8 emphasizes the focus on the interaction between the customer and the firm. This study proposes that communication tensions, and tensions due to the contradictory perspectives of the customer and the development team, need to be mitigated in order for the service to be viewed as customer-oriented and relational. Furthermore, the foundational premises FP1 and FP2 can be created only once the customer and the firm have established the foundation necessary to exchange knowledge and skills (Vargo & Lusch, 2008). This research suggests that communication tensions between the customer and the development team must be mitigated in order for value to be co-created. If there is a communication gap between the customer and the development team, arguably, direct and indirect exchanges of knowledge and skills centered on the customer are difficult to attain. Since the value co-creation process includes actions by the customer and the firm (Grönroos & Voima, 2013), if tension exists in the communication between the customer and the firm, or if there are tensions due to their distinct orientations (technology vs. customer), this will affect the value co-creation process. While the foundational premise FP9 identifies the actors involved in the service exchange as resource integrators (Vargo & Lusch, 2008), the present study emphasizes that value co-creation can be achieved only once the service ecosystem tensions have been mitigated and the service platform challenges have been addressed. Lusch and Nambisan (2015) explain that the value co-creation process is supported by

resource integration. In our study, we observed that resource integration occurred after the service ecosystem tensions had been mitigated and the service platform challenges had been addressed.

Grönroos and Voima (2013)'s revised the SDL foundational premises (FP6, FP7A, FP7B, FP10) help explain the roles played by SERVICEINC and the customer in the value co-creation process. Nevertheless, the results of the present study suggest that these revised foundational premises did not account for the tensions in the service ecosystem and the service platform challenges observed before value was co-created. The revised foundational premise FP6 suggests that the customer is the value creator (Grönroos & Voima, 2013). Moreover, in this study, when the company had the opportunity to join the customer in the value creation process (Grönroos & Voima, 2013; Heinonen et al., 2010), value was co-created. The original foundational premise FP6, as presented by Vargo and Lusch (2004) and later revised by (Vargo & Lusch, 2006; Vargo & Lusch, 2008), suggests (as described by Grönroos and Voima (2013) that everything is a value creation process, and that if the roles of the actors involved in the value co-creation process are not well-defined, it is difficult to understand how value is co-created. In this study, we identified the roles of the customers and other stakeholders in Project MAGENTA. This research suggests that if the service ecosystem tensions are not mitigated, the value co-creation process will be compromised.

According to the revised foundational premise FP7a, the firm is a potential value facilitator for the customer, and the firm can engage with the customer in the value creation process (Grönroos & Voima, 2013). The results of our analysis indicate that the studied firm designed, developed, and delivered resources that had value for the customer, and that the firm was able to be part of the value co-creation process along with the customer. Furthermore, according to the revised foundational premise F7b, the company was not restricted with regard to making value propositions, but also with regard to influencing the customers' value creation processes, as described by (Grönroos & Voima, 2013). These two foundational premises were possible only after the service ecosystem tensions had been mitigated, and the service platform challenges had been addressed.

The revised foundational premise FP10 describes that the value creation process is an accumulation of experiences (Grönroos & Voima, 2013). Project MAGENTA used an iterative process, where the customer helped SERVICEINC design, test, and implement a software application in ninety days. This analysis supports the premise that the customer experience is accumulated throughout the life cycle of a project, through constant direct and indirect interactions (Prahalad & Ramaswamy, 2004b). Thus, the present study highlights a value co-creation process in which all actors, including the firm, the vendor, and the customer, were constantly interacting to mitigate the tensions in the service ecosystem and working on addressing the challenges in the service platform.

The findings of this research extend the knowledge of the role played by agile distributed methods in value co-creation. Agile practices are centered on the customer, such that the customer is co-located with the development team (Cao et al., 2004). In this study, when the development team was distributed, the customer remained at the center of the software development process, and the service innovation process was facilitated through agile distributed practices (Ramesh et al., 2006; Ramesh et al., 2012). The balanced IS development practices identified in this study are very similar to practices that have been observed in agile distributed product development contexts (Ramesh et al., 2006; Ramesh et al., 2012). In contrast, our study examined how value co-creation was facilitated by three balanced IS development practices and two governance mechanisms, which mitigated the tensions and addressed the challenges.

Value co-creation has been recognized as an important process through which the firm and the customer become collaborators in the innovation process (Prahalad & Ramaswamy, 2004b). The value co-creation model presented by Prahalad and Ramaswamy (2004a), commonly known as DART, includes four main components: dialogue, access, risk assessment, and transparency. These four elements are present in the agile distributed practices described in the present study as enablers of value co-creation as follows. Dialogue is part of the practice of constant communication, which is necessary to maintain a unified development team and formal but flexible structures; risk assessment and

transparency are necessary in the fostering of trust through informal collaboration (which is documented *post facto* for verification); and access is present in all practices, since the customer is at the center of the value co-creation process. Thus the findings of this study provide a nuanced theoretical understanding of how agile distributed practices facilitate value co-creation. Project MAGENTA was centered on the customer (Vargo & Akaka, 2009; Vargo & Lusch, 2004, 2008). However, for a mature service organization, value co-creation is a process that does not come naturally, due to the silo structure that tends to develop over the years.

In summary, the results of this study address an important gap in the literature relating to the question of how a service organization achieves service innovation through value co-creation.

V.2 Practical Contributions

Following Lusch and Nambisan (2015) service innovation framework, this study offers recommendations to several actors (i.e., senior executives, senior management, development team members, and vendors) concerning how a service organization can foster service innovation. The practical suggestions presented may assist these actors in addressing the challenges of the service platform and in mitigating the tensions of the service ecosystem.

1. **Lead project manager**

   The lead project manager plays a crucial role in the overall success of a project. To ensure that the project stays on track, the lead project manager needs to have good understanding of the entire project, including data and team assignments, as well as have the freedom to do whatever is necessary to meet the deadline specified for the project. The lead project manager is expected to work closely with the development team and the customer and to become involved when necessary to effectively manage the project timeline.

2. **Constant communication**

   Large organizations tend to have distributed development teams and complex collaborative efforts. The findings of this research suggest that constant communication is necessary to facilitate a common perspective when the development process requires distributed work. The requisite creation of channels for constant communication may involve significant changes for mature service companies, whose processes and structures may not be conducive to a value co-creation process. Constant communication mitigates the tension that exists when development teams are not co-located and when there is a diversity of knowledge and skills. Constant communication helps to create a more unified structure.

3. **Involve the customer from the beginning of the innovation process**

   Mature service organizations tend to involve the customer (e.g. through customer satisfaction surveys) at the end of the value creation process in an effort to customize new services. Inviting customers to be part of this process from the beginning is not easy for a mature service company like SERVICEINC. Customer-company interactions should be based on trust, transparency, and constant communication.

4. **Executive support**

   Executive support allows a team of experts to be fully dedicated to a project and to fully support the project when the development team faces roadblocks, such as delays in approving vendors or IT technical support tickets, which can be immediately escalated to facilitate immediate attention. Executive support ensures full support for the development team, thus ensuring that the timeline will be fulfilled.

5. **The innovation effort should not last indefinitely**

   It is necessary to give organizations short-term goal, to which they can completely commit their resources. When innovation projects last for a long period of time, it is difficult for a service organization to fully support them. Full commitment from both the business side and IT is necessary to ensure that the customer is at the center of the

development process. A mature service organization may not believe that service innovation is achievable, due to company structure, lack of collaboration, and an absence of constant communication. The approach presented in this study can be facilitated through agile distributed methods.

6. **Technology to improve the customer experience**
   Technology investments should be seen, not only as a way to improve resource integration, but also as a way to improve the overall customer experience offered by the service organization. The customer should be involved at the center, not at the end, of the co-creation process. If innovation is thought to improve solely the features of a service, rather than the customer experience as a whole, the resulting innovation projects will not be connected to the customer at all. The integration of new technology as a way to co-create value with customers—and, thereby, to improve the customer experience—will continue to support future innovation efforts, since innovation projects will be driven by customers' feedback.

V.3 Limitations and Future Research

V.3.1 Limitations

As this study was designed as a single case study, generalizability may be limited (Miles & Huberman, 1994); however, the research design facilitated a better understanding of the case through the different perspectives provided by the informants (Miles & Huberman, 1994; Yin, 2009). The single case design also provided a unique opportunity to extend the existing understanding (Yin, 2009) of value co-creation enabled by agile distributed practices. The case study was also an opportunity to inform research, not only through semi-structured interviews but also through other data sources, reducing potential bias by the use of triangulation (Miles & Huberman, 1994; Yin, 2009).

The fact that only one researcher coded the data can be considered a limitation. However, in qualitative studies, having a single coder with some familiarity with and a conceptual

interest in the phenomenon being studied increases the validity and reliability of the study (Miles & Huberman, 1994). Despite this limitation, the findings of this research make a significant contribution to the understanding of how a service organization fosters service innovation through value co-creation enabled by agile distributed methods.

V.3.2 Future Research

This research focused on providing a deeper understanding of the service innovation elements that contribute to value co-creation through an SDL lens. Other related theories, such as ambidexterity (Tushman & O'Reilly III, 1996), may also extend the understanding of the tensions and challenges articulated in this study. Our study suggests some opportunities to broaden the view of service innovation in terms of generalizability through replicating this research in other service innovation settings. Although this research only studied one project in the U.S., relevant value co-creation lessons have emerged. Likewise, due to globalization, distributed teams are becoming more common; therefore, by studying the impact of culture on the value co-creation process, additional insights and understanding in service innovation may be discovered.

For mature service organizations, service innovation cannot be a one-time event, and future research might explore, through longitudinal studies, how service innovation should be maintained inside a firm. The management of service innovation theories (Sundbo, 1997) could also provide additional insights into how this process should be managed inside organizations.

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VII APPENDIX

ILLUSTRATION OF A START LIST OF CODES

SERVICE ECOSYSTEM	**SE**	**2.0**
Service Ecosystem: A relatively self-contained, self-adjusting system of loosely couple social and economic actors (firm – customers) integrated by shared institutional logics and mutual value creation through service exchange.		
SE: Service Exchange	SE: SE	2.1
SE: Structural Flexibility	SE: SF	2.2
SE: Structural Integrity	SE: SI	2.3
SE: Cognitive Distance	SE: CD	2.4
SE: Shared Worldview	SE: SW	2.5
SE: Architecture of Participation	SE: AOP	2.6

SERVICE PLATFORM	**SF**	**3.0**
A service platform is the structure that assists in the collaboration between actors and resources, and it also serves as the venue for service innovation.		
SP: Role of IT	SF: RIT	3.1
SP: Layered-Modular Architecture	SF: LMA	3.2
SP: Rules of Exchange	SF: ROE	3.3

AGILE PRACTICES	**AP**	**4.0**
A service platform is the structure that assists in the collaboration between actors and resources, and it also serves as the venue for service innovation.		
AP: Description Agile Practices	AP: RIT	4.1
AP: Challenges	AP: CHA	4.2

VALUE CO-CREATION	**VC**	**5.0**

Value co-creation is a collective process through which the interactions of a firm and its customers facilitate the creation of value.

VC:	Role of the customer	VC: ROC	5.1
VC:	Role of IT	VC: RIT	5.2
VC:	Collaboration	VC: COL	5.3
VC:	Challenges	VC: CHA	5.4
VC:	Measurement	VC: MEA	5.5