Customer Participation Risk Management: Conceptual Model and Managerial Assessment Tool

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Abstract

Purpose: Customer Participation (CP) has received considerable interest in the service literature as a way to improve the customer experience and reduce service providers' costs. While its benefits are not in question, there is a paucity of research on potential pitfalls. This paper provides a conceptual foundation to address this gap and develops a comprehensive model of the risks of customer participation in service delivery, integrating research from the marketing, operations and supply chain management, strategy, and information technology fields.

Design/methodology/approach: The model is derived deductively by integrating insights from research in marketing, operations and supply chain management, strategy, and information technology.

Findings: This paper identifies three categories of potential risks of CP (i.e., market, operational, and service network) and discusses ways that firms can mitigate these risks. Building on the model, it develops a CP risk assessment tool that managers can use when evaluating increases in CP.

Research limitations/implications: The conceptual model proposed in this paper can serve as a robust basis for future research in customer participation, particularly in such areas as sharing economy services, service delivery networks, and experiential services. The risk assessment tool offers clear guidelines for managers who are considering an increase in customer participation in their service.

Originality/value: This is the first attempt to conceptually define customer participation risk and develop a comprehensive model of its drivers and strategies to mitigate it. This paper develops a straightforward method for managers to evaluate CP risk.

Keywords

Customer participation risk, Service system design, Risk mitigation, Co-creation, Co-production

1 Introduction

Customer participation (CP) has been a central theme in the service management literature (Eiglier and Langeard, 1977, Chase, 1981, Bitner *et al.*, 1997, Prahalad and Ramaswamy, 2004, Vargo and Lusch, 2004, Xie *et al.*, 2008, Mustak *et al.*, 2016, Schallehn *et al.*, 2019). CP and the related terms co-production, co-creation of value and customer engagement recognize the value of customer input to service design, production and delivery to improve service performance (Bendapudi and Leone, 2003). More recently, innovations in information and related technologies and the emergence of novel contexts such as the sharing economy, experiential, and knowledge-based services have accelerated the interest in reconfiguring service systems to take advantage of increased customer participation (Field *et al.*, 2018).

Research on CP has largely focused on its potential benefits. These include gains in productivity, quality and customer experience. However, relatively little has been developed about the potential risks of increasing customer participation, nor about the appropriate risk mitigation strategies (Gebauer *et al.*, 2013, Dong and Sivakumar, 2015, Heidenreich *et al.*, 2015, Jaakkola *et al.*, 2015, Mustak *et al.*, 2016).

Increasing CP requirements may alter the needed skills and motivation of customers to perform their role (Damali *et al.*, 2016). It might also reduce the demand for the service or increase the number of failures (Frei, 2006). In addition, it may require more coordination with suppliers, adding to the service system's complexity and ongoing costs (Tax *et al.*, 2013). Without considering the cost of these potential problems and the steps taken to mitigate them, firms may greatly overestimate the net rewards of increased CP. While some potential challenges of increased CP have been identified, there is no comprehensive model that arrays the associated

risks nor outlines potential risk mitigation approaches (Heidenreich *et al.*, 2015, Mustak *et al.*, 2016).

A central theme in service design is determining the role of the customer throughout the stages of the customer journey (Lemon and Verhoef, 2016). While you cannot completely control or predict customer reactions to altered roles or their performance in those roles (Patricio *et al.,* 2011), designing the process to account for their varied performance is critical. While the risk of increasing participation has been recognized, (Field *et al.*, 2012, Damali *et al.*, 2016, So *et al.*, 2016, Secchi *et al.*, 2019), no comprehensive framework to understand and manage those risks has been developed. This paper addresses this important gap.

IKEA is a good example in practice of this gap, where its introduction of self-service checkout illustrates the range of such risks and mitigation practices (Gagliordi, 2012). Self-service checkout is an increasingly common way retail customers are given a higher level of participation, offering them greater control while reducing the service provider's staffing costs. In IKEA's case, customers found the technology difficult to use and the instructions unclear. This led to operational risks such as slow service and long waiting lines, and market risks such as negative publicity surrounding a rash of complaints from frustrated customers. Further, increased customer participation required a second checkout screen to provide instructions for customers. However, due to the lack of coordination between IKEA and its technology supplier, this second screen was not included, adding to the risks. At that time, rather than mitigating the risks in using the self-service checkout systems, IKEA instead removed them from its US stores. By projecting where the system might have faced difficulties, IKEA could have also planned for, and costed out, steps to reduce the potential negative impacts where some proportion of customers were unhappy with or unable to fulfill their intended participative roles.

The purpose of this paper is twofold. First, it proposes a comprehensive model of managing increased CP applicable in all services. While various types of CP inputs, risks and mitigation practices have been identified, no model has been proposed that integrate them into a coherent framework (Heidenreich *et al.*, 2015, Mustak *et al.*, 2016). Using MacInnis (2011) classification of conceptual paper contributions, this paper's role is one of "delineating" by integrating models, theories and frameworks from service management (Bowen, 1986, Frei, 2006, Mustak *et al.*, 2016), innovation adoption (Rogers, 2003), supply chain management (Zsidisin and Ellram, 2003), and quality management (Feigenbaum, 1956). The resulting model provides a more comprehensive picture of risk management than any individual framework drawn from disparate fields that deliver parts but not the complete picture.

Second, this paper provides a service design tool based on the proposed model. This tool contributes to practice by giving managers an analytical approach for identifying potential sources of risk with increased CP and the mitigation strategies that can counter them. Ultimately, the combination of risk mitigation costs plus the cost of any remaining service failures represents an ongoing downside for the prospective change. This offers managers a means to make more balanced assessments of the pros and cons of expanding CP in their service processes. The model and analytical tool can benefit future research on customer participation in emerging areas such as the sharing economy and experiential services (Field *et al.*, 2018).

These contributions are provided by first reviewing the CP literature and developing a formal definition of CP risk, based on the perspective provided in the strategic management literature (Miller, 1992; Porter, 1980). Next, a conceptual model of the CP risk management process is developed. The model includes six types of customer inputs identified in the service

management literature (Mustak *et al.,* 2016) and their corresponding potential risks, the associated mitigation strategies, and a discussion of the resulting costs

In building the model, this paper relies on research from diverse literatures to support the discussion of the three risk categories and mitigation strategies. Market risk focuses on the decision of customers to take on new roles. The diffusion of innovation literature provides a well-established framework to understand that decision and mitigation options (Rogers 2003). Operational risk focuses mainly on the diverse impacts of customer performance. The dominant quality management framework, the cost of quality model (e.g., Feigenbaum, 1956), provides a comprehensive perspective in dealing with the risks associated with such customer behavior. Network risk issues have been addressed most effectively in the supplier management stream of research (e.g., Zsidisin and Ellram, 2003).

A managerial tool is proposed, based on the conceptual model, and its value demonstrated by applying it to the adoption of home-based dialysis treatment. The paper finally discusses managerial implications, contributions to theory and future research opportunities.

2 Customer Participation and Risk

The customer's central role in a service delivery system is well documented. Its initial portrayal in the servuction model indicated that customers may impact their own experiences and those of other customers, as well as the firm's productivity (Eiglier and Langeard, 1977). This and other early models – such as the customer contact model (Chase, 1978) and design tools like service blueprinting (Shostack, 1984) – focused on the customer being present (providing passive participation) in the service system. Attention later shifted to self-service and information technologies that allow significant service productivity increases through customers' active

participation (Mersha, 1990, Meuter *et al.*, 2000, Scherer *et al.*, 2015). Increased CP is now viewed not only as a practice to increase productivity and quality, but also a strategic decision, arguing that it can serve as a source of competitive advantage (Prahalad and Ramaswamy, 2004, Vargo and Lusch, 2004).

As research has evolved, so too have the labels for the customer's role in the service delivery system. The most frequently used labels are co-creation, co-production, engagement and participation, which provided the scope of the literature search. While a portion of this research used these terms interchangeably, over the years some distinctions have been proposed.

Co-production represents participation in the development of the core offering itself (Lusch and Vargo, 2006). Co-production research focuses on customer labor inputs needed in a relatively simple, dyadic processes specified by the service organization, such as a customer using a self-service technology (Fließ and Kleinaltenkamp, 2004, Sampson and Froehle, 2006, Dong *et al.*, 2015, Sampson and Money, 2015).

Co-creation of value recognizes that value creation is interactional (Vargo and Lusch 2008) and may encompass customer inputs such as the knowledge and competency needed for the service transformation. This may involve innovations and more customized solutions (Bitner *et al.*, 1997, Lusch and Vargo, 2006, Grönroos, 2011, McColl-Kennedy *et al.*, 2012, Jaakkola *et al.*, 2015, Stokburger-Sauer *et al.*, 2016).

Customer engagement is a psychological state resulting from the interaction between the customer and the service system (Brodie *et al.*, 2011, Pansari and Kumar, 2017). This literature has identified customer behaviors (e.g., voluntary customer participation or customer citizenship behaviors) as a primary outcome of engagement. Further, it focuses on the interactions and relationship building between customers and service network partners needed for co-creation of

value (Brodie *et al.*, 2011, So *et al.*, 2016). Even with the above distinctions, the demarcation is not clear as some research considers engagement and co-production as being important facets of co-creation (Vargo and Lusch, 2004, McColl-Kennedy *et al.*, 2012, Jaakkola *et al.*, 2015, Stokburger-Sauer *et al.*, 2016).

Rather than making distinctions, CP is more broadly viewed as the customer's contribution of labor or resources to the creation of offerings (e.g., Bendapudi and Leone, 2003, Mustak *et al.,* 2013). Two recent formal definitions of CP underscore its generic and encompassing nature: "*customers' provision of inputs, including effort, time, knowledge, or other resources related to service production and delivery* (Mustak *et al.*, 2016, p. 250), and "*the degree to which customers are involved in service production and delivery"* (Dong and Sivakumar, 2015, p. 726).

Research related to CP has predominantly sought to identify its positive outcomes (see Jaakkola *et al.*, 2015, and Mustak *et al.*, 2016 for recent reviews). The benefits have been observed in diverse settings including hospitality, financial, professional, healthcare, experiential and transformational services (Xue and Field, 2008, Field *et al.*, 2012, McColl-Kennedy *et al.*, 2012, Zhang *et al.*, 2014). From a strategic perspective, effective CP can provide competitive advantage (Prahalad and Ramaswamy, 2004, Tax *et al.*, 2006). Customers' knowledge sharing and involvement in the design and delivery can create unique solutions that improve perceptions of service quality (Dabholkar, 1996, Lengnick-Hall, 1996, Vargo and Lusch, 2004). From a marketing perspective, effective customer participation promotes engagement, flexibility, autonomy and control that lead to better overall marketing performance, improved customer satisfaction and loyalty (Bateson, 2002, Bitner *et al.*, 2002, Halbesleben and Buckley, 2004). Operations management research has found that effective customer participation offers potential

cost reductions and quality improvements (Xue and Harker, 2002, Halbesleben and Buckley, 2004, Frei, 2008). Customers often substitute for the firm's labor and contribute by using their own vehicles, computers or smartphones (Sampson and Froehle, 2006, Mustak *et al.*, 2016). This combination of improved customer experience and cost reduction makes increasing customer participation attractive.

While the research on CP risk and its mitigation is emerging, it is still sparse compared with research on its benefits. The risks associated with increased CP have been described in practitioner-oriented sources and news reports (Marous, 2013, Carter, 2014, Williams, 2014) as well as a growing body of scholarly research (Parasuraman, 2006, Xie *et al.*, 2008, Zhu *et al.*, 2013, Heidenreich *et al.*, 2015, Jaakkola *et al.*, 2015, Joosten *et al.*, 2016, Mustak *et al.*, 2016). Reported risks tend to mirror the intended benefits of increasing CP, with customer satisfaction and loyalty, as well as service quality and profitability, being negatively impacted.

To advance a comprehensive understanding of CP risk, this paper draws on the conceptualization of risk prevalent in the strategic management literature. Miller (1992) argues that risk has been used to denote both the unpredictability of the variables that influence performance outcomes as well as the unpredictability of performance outcomes themselves. Since this dual definition of risk created a confusion, (Miller, 1992) limited the use of the term risk to the unpredictability associated with negative performance outcomes. In the same vein, (Porter, 1980) associates risk with negative performance outcomes, specifically strategic decisions that increase "the exposure to adverse consequences when the "wrong scenario" occurs" (p. 476). Following the Miller (1992) and (Porter, 1980)'s logic, this paper considers CP risk as the potential downsides caused by a service system's increased CP requirements. Thus,

CP risk is defined as the *service provider's exposure to adverse consequences resulting from the increased customer participation.*

3 Conceptual Model

Without an existing framework to classify CP risks, the conceptual model is derived from common principles of service design. Successful service strategies are predicated on aligning the service concept (the basic offering), the target market (specific customers' willingness to use the service), and the service delivery system (how the service is provided) (Heskett, 1987, Roth and Menor, 2003, Ponsignon *et al.*, 2011). The new service concept requiring increased CP may not be aligned with the target market, leading to a potential loss of customers, inability to attract new ones, or attracting those who do not fit (*market risk*). Further, customers who accept this new service concept may interact unpredictably with the service delivery system, leading to a loss in efficiency (*operational risk*). In addition, this new concept may not be aligned with the firm's suppliers or other related service providers that support the customer experience (*network risk*). Figure 1 denotes these three risk categories. The categories of CP risk cover the domain of the concept by including all stakeholders internally and externally influenced by the increased CP. They cover the entire customer journey, including the decision making for purchasing to the post-service communication to other potential customers (van Doorn *et al.*, 2010).

In building the model, research from diverse literatures is relied upon to support the discussion of the three risk categories. Market risk focuses on the decision of customers to take on new roles. The diffusion of innovation literature provides a well-established framework to understand that decision (Rogers, 2003). Operational risk focuses mainly on the diverse impacts of customer performance. The dominant quality management framework, the cost of quality

model (Feigenbaum, 1956), provides a comprehensive perspective in dealing with the risks associated with such customer behavior. Finally, network risks have been addressed most effectively in the supplier management stream of research (e.g., Zsidisin and Ellram, 2003). Each of these are explored in turn in building the conceptual framework.

The model is organized around the steps that firms should take in assessing a designed increase to CP: risk assessment, review of potential risk mitigation alternatives and projection of likely costs of risk mitigation plus those of residual negative outcomes. Note that the model only considers the risks of *increasing* CP, that is, in changing the service process to expand the customer's role in some form. While "increased participation" may involve greater reliance on some types of customer input while diminishing the need for customers to provide others, this paper's main concern is where the firm expects customers to provide significantly more of one or more types of inputs. As well, they cover those related to implemented changes, as opposed to "customer co-creation" roles of providing knowledge and competency inputs to a firm's service conceptualization and design and innovation processes.

[Insert Figure 1 here]

3.1 Increased Customer Participation Inputs

Figure 1 starts with a list of inputs that customers provide in performing their roles. Broadly, CP research emphasizes customer knowledge and competency inputs, labor inputs and citizenship behavior inputs (Sampson and Froehle, 2006, Mustak *et al.*, 2016). Some of these inputs can be passive, such as customers being present in the service (e.g., watching a movie) or allowing themselves to be transformed (e.g., a hair salon). Customers may also provide some materials

for transformation (e.g., dry cleaning). Other inputs require action, such as providing labor or information and using their knowledge to solve complex problems (e.g., the diagnosis and treatment of a health condition). In addition, the customers may be required provide technology (e.g., getting an Uber using a smartphone) or bring their own support network (e.g., the treatment of chronic conditions often requires the support of a family member) to co-create the service. It is important to recognize which specific input types will have increased requirements with an anticipated change.

3.2 CP Market risk

Increasing CP requirements may misalign the firm's service concept with its market (Heskett, 1987, Shostack, 1987, Roth and Menor, 2003). Specifically, requiring greater CP alters the value proposition. This uncertainty in the market's reaction can expose the firm to the risk of losing some of its customers or reputation (Bitner *et al.*, 1997, Gebauer *et al.*, 2013). This exposure is termed *market risk – the potential adverse market consequences due to increased customer participation, which may include reduced revenue, market share or reputation*.

Market risk has been discussed in various service contexts, such as hospitality (Edvardsson *et al.*, 2005, Zhang *et al.*, 2014) and healthcare services (McColl-Kennedy *et al.*, 2012, Čaić *et al.*, 2018). For example, hotels that are transforming to be more eco-friendly require increased level of CP (Zhang *et al.*, 2014). They often provide fewer resources to their customers (e.g., towels) and expect customers to perform additional tasks such as keeping the room air conditioning off when they are out. In the context of elderly care, patients are increasingly expected to participate more, particularly increasing the use of technology (Čaić *et al.*, 2018). For example, instead of service providers taking responsibility to adjust patient

entertainment devices, now technology (e.g., smart speakers or animal companion robots) supports patient self-managing the process. Patients who are not comfortable with this practice may choose alternative care providers. Competitors may also fill in the niche created by the shift.

3.3 CP Operational risk

Increasing CP requirements may misalign the firm's service concept with the requirements of the service delivery system (Shostack, 1987, Roth and Menor, 2003). The operations management field has long recognized that having customers undertake participatory roles introduces uncertainty and unpredictability (Chase, 1978). Specifically, uncertainty is associated with customers' ability and motivation to perform their roles correctly as well as the appropriateness of expecting them to carry out these new roles (Damali *et al.*, 2016). This can expose the firm to the risk of customer failures or "mis-performances" (that is, incidents where customers carry out their tasks inappropriately, either deliberately or inadvertently) negatively affecting that customer, other customers, service workers and firm productivity (Bowen, 1986, Frei, 2006). *Operational risk* is defined as *the exposure to customer mis-performance and failure caused by an increase in CP.*

Recent service management research extensively discusses the operational risk of increasing CP. One such discussion concerns the optimal level of CP. The argument is that increasing CP requires higher levels of customer effort and time, so there is an inverted U-shape relationship between their participation and their effective service behavior (Roels, 2014, Stokburger-Sauer *et al.*, 2016). Another discussion focuses on stakeholders being negatively affected by customer mis-performance. This research explains how customers can negatively impact other customer's performance and experience (Rihova *et al.*, 2013, Zhao *et al.*, 2015).

Specifically, some proportion of customers will carry out their role ineffectively – not showing up when scheduled, taking an inordinate amount of time or resources to do their tasks, misusing firm resources, or disrupting other customers' experiences – generating exposure to a systemic loss of efficiency or effectiveness. By placing even simple new tasks in the hands of customers to replace comparable tasks performed by employees and in-house systems, the firm should expect increased uncertainty in outcomes (Field *et al.*, 2012).

Poorly executed customer roles, whether intentional or not, may be viewed as mis-performances. In evaluating the firm's exposure to negative outcomes, it is important to distinguish between mis-performance and service failure. Service failures occur when customers perceive that the service did not meet their expectations. Mis-performing customers may perceive no service failure for themselves but still cause productivity losses, damage to facilities or disruptions to employees and other customers (Tax *et al.*, 2006). The firm must be concerned not only with service failures resulting in dissatisfaction but also mis-performances that the customer may not be aware of or be concerned about creating.

3.4 CP Network Risk

Service management research has paid increasing attention to the role of service delivery networks, comprising the service firm's supply chain as well as other entities instrumental in the service delivery (Tax *et al.*, 2013, Ostrom *et al.*, 2015, Field *et al.*, 2018, Brodie *et al.*, 2019). Shifting tasks to customers can increase uncertainty about how service delivery network partners and suppliers will adapt to their new roles (Akkermans and Vos, 2003, Kim *et al.*, 2007, Harvey, 2016). However, this uncertainty can expose the service firm to the network risk, defined as *the*

firm's exposure to failures arising from the unpredictability of service delivery networks and supply chain partners' response to an increase in CP.

Research in this domain assesses how increased CP escalates complexity and uncertainty of the service delivery system (McColl-Kennedy *et al.*, 2012, Pinho *et al.*, 2014, Alexander *et al.*, 2017, Brodie *et al.*, 2019). For example, having customers generate their own airline boarding passes or cinema tickets brings a host of different entities (e.g., internet service providers and computer or smartphone producers) into the service delivery process. However, these firms may have trouble meeting new demands, such as call center contractors who cannot provide appropriate support for customers struggling to perform unfamiliar tasks, or technical support suppliers who are used to dealing with institutional customers. Further, network risk can also stem from the opportunistic behavior of suppliers who gain greater contact with the firm's customers, which may necessitate more supplier monitoring and coordination steps (Williamson, 1979). Service providers may have limited choice (and often, limited knowledge) of which organizations customers will rely on, increasing uncertainty about possible service delivery outcomes (Tax *et al.*, 2013). When customers are free to choose their service co-providers, they may opt for ones that fit poorly, creating problems for the focal firm.

This research also discusses the risk from the network partner's perspective. Increased CP may also create risks for the service firm's contracted suppliers, if the firm makes customers responsible for providing materials or services that were previously offered in-house (Baltacioglu *et al.*, 2007, Harvey, 2016). Increased uncertainty in supplier requirements may also stem from channel proliferation if the firm introduces additional channels as optional service alternatives. Demand patterns for each process will become less predictable, complicating capacity allocation decisions (Akkermans and Vos, 2003). For example, an airline that offers the

option of online check-in can expect to reduce its requirements for printed boarding passes – but increase the need for contracted call center services. Compared to having the airline's own agents print all boarding passes, the new optional customer role injects uncertainty into managing the firm's supplier network.

4 Risk Mitigation

The first stage in managing the risks of increased CP is to recognize the potential problem sources. Although risks cannot be eliminated, the service design process should anticipate where they are likely to occur, and then incorporate appropriate mitigation practices. By accounting for the potential costs of such steps, a firm can take a balanced view, seeking a suitable level of CP that weighs the expected advantages against the total expected costs of mitigating the inherent risks plus those of the estimated residual losses from the mis-performances and service failures that are still bound to occur.

This perspective adopts the premise that has shaped thinking in the area of quality management (Feigenbaum, 1956, Juran, 1962, Crosby, 1979). In the *total cost of quality* view, the firm can on the one hand plan to expend resources to prevent errors and improve the process (prevention costs) and to monitor outcomes (appraisal costs). On the other hand, it faces losses through the inevitable mistakes that it catches and absorbs (internal failure costs) plus those that affect customers through service failure (external failure costs). Properly executed, efforts on the prevention and appraisal side ("conformance costs") greatly offset their costs through reduced failure costs ("non-conformance costs") (Plunkett and Dale, 1988, Schiffauerova and Thomson, 2006).

The quality literature identifies two generic approaches for promoting "conformance" in the face of operational risks, *prevention* and *accommodation*, that may be used simultaneously. Prevention steps reduce the possibility of mis-performance and failure through better customer preparation, improved process design and monitoring. Accommodation steps buffer the system from the effects of mis-performance, typically by adding resources (additional employees, more self-checkout counters, extra materials) that avert possible service failures. The first approach is referred to variously as prevention in quality management research (Juran, 1962), variability reduction in service operations management (Frei, 2006), and behavioral modification in supply chain research (Zsidisin and Ellram, 2003). Service operations management refers to accommodation or buffering for the second approach (Frei, 2006).

4.1 CP market risk mitigation

From the customer's perspective, increased CP can be viewed as the introduction of an innovation to a service design. Previous research on customer participation has shown that increasing CP can lead to a decrease in self-efficacy (Wünderlich *et al.*, 2013), increase in role conflict (Moeller *et al.*, 2013) and goal incongruence ultimately leading to lack of customer retention (Guo *et al.*, 2013). Insights from the innovation adoption model (Rogers, 2003) and similar models such as the technology acceptance model (Davis, 1989, Venkatesh and Davis, 2000, Venkatesh and Bala, 2008) are useful to understand this phenomenon. Innovation models that study effects of migrating services from a human to technological interfaces have shown that even a small expansion to the customer's role may engender greater uncertainty in usage (Montoya-Weiss *et al.*, 2003, Xue *et al.*, 2011).

Mitigating market risk involves anticipating and reducing barriers to customers accepting their new role. A framework to promote acceptance of a new practice, such as an increased CP requirement, can be derived from Rogers (2003) widely studied approach to the adoption of innovations:

1. Communicate and design the innovation to promote its relative advantage, compatibility with familiar norms and its ease of use/low complexity
2. Provide incentives to users
3. Allow for pre-use trial and observation
4. Keep the current system(s) also in place
5. Manage negative reactions

First, several CP studies have linked the importance of effectively designing and communicating customer benefits in terms of cost and time savings and improved quality (e.g., Meuter *et al.*, 2005, Zhang *et al.*, 2014, Dong *et al.*, 2015, Čaić *et al.*, 2018). Zhang *et al.*, (2014) demonstrated that showing the environmental impact of their actions increased CP for those customers who valued sustainable business practices. With respect to compatibility, in a healthcare study, McColl-Kennedy *et al.* (2012) showed how matching co-creating styles with patient expectations and preferences could improve adoption and performance, reducing both market and operational risk.

Second, where the new role represents little apparent advantage or is overly complex for widespread acceptance, incentives can be provided. Zhang *et al.* (2018), in a critical incident study, found organizational incentives enhanced engagement and increased CP. Rogers (2003) suggests that incentives should be temporary but that firms should recognize the risk that slow

acceptance of a process change might require extending the period during which incentives are offered. For example, in many areas, self-serve fuel pumps still provide a lower price than the full-service option, even though customers in other regions have long accepted the higher-participation role without this incentive.

Third, allowing customers to observe how others are effectively using the new process or allowing them to try out the new role prior to committing to adoption enhances customer readiness and reduces the perceived risk (Edvardsson *et al.*, 2005, Meuter *et al.*, 2005). "Observability" is promoted through process changes by making user advantages visible to potential adopters, such as the speed with which airline check-in kiosk users bypass travelers waiting in regular check-in lines. "Trialability" may involve developing a mock system that simulates what the customer will experience in performing the higher-participation role. (Edvardsson *et al.*, 2011) showed how enhancing trialability using "experience rooms" and "hyper-reality" to test the impact of co-creation changes could reduce market risk. Acknowledging the potential fears of changed service roles and providing training and education to enhance role readiness has been shown to support adoption of new customer roles (Verleye *et al.*, 2014, Čaić *et al.*, 2018).

Fourth, the service firm can keep the existing process in place until a significant portion of the potential customers adopt the new one. This is an example of an accommodation approach, essentially allowing customers to "fail" to adopt the new system. Channel migration researchers point to the wisdom of maintaining parallel processes and gradually moving customers to the new higher-participation system (Van Bruggen *et al.*, 2010, Polo and Sese, 2016). Businesses, especially in retailing, are embracing this strategy to the point of blurring the distinction between different channels, creating a highly personalized blend referred to as

omnichannel service (Brynjolfsson *et al.*, 2013). While this accommodating tactic undoubtedly reduces the risk of losing customers, the ongoing cost of maintaining and coordinating more process options must be factored into the assessment.

Finally, there will always be the risk of negative customer or media reactions (Rogers, 2003). The new process may introduce new modes of service failures and the firm may have to develop alternative service recovery processes. There is a risk that negative reactions may blossom on social media, requiring ongoing additional costs of monitoring and countering their effects (Colliander and Dahlén, 2011). While deploying new service recovery mechanisms and additional media monitoring are preventative steps, service recovery and opinion-shaping efforts represent accommodation costs, ones that may have to be maintained for considerable time following the change's launch.

4.2 Operational risk mitigation

Operational risk mitigation reduces possible customer mis-performance and service recovery requirements. Frei (2006) argues that "wherever customer-introduced variability creates operational issues for a company, managers face a choice: Do they want to accommodate that variability or reduce it?" (p. 95). Variability reduction relies on prevention steps that constrain customer behavior to avoid mis-performance and its potential consequences. Variability accommodation aims to buffer the system, shielding the customer, other customers and the firm's resources from possible mis-performances that may occur despite preventative steps. Accommodation also extends to the service recovery requirements that still occur despite these measures.

The primary prevention approach is to simplify the system where it interacts with the customer. In designing services, managers should consider the skill level and motivation needed to complete the new tasks, comparing them to what intended customers are likely to possess. Mis-performance prevention starts with reducing the threshold for skill and knowledge requirements through the use of well-established operations management practices such as *poka-yokes* (mistake-proofing mechanisms), task simplification, and clear layouts and instructions for navigating physical or virtual sites (Cook *et al.*, 2002, Mustak *et al.*, 2016). (Chase and Stewart, 1994) was the first paper to study the value of poka-yokes to prevent customers from failing in their co-production role in services.

A second approach is to apply human resource management practices and treat customers as "partial employees" through practices such as customer selection (allowing only qualified customers to use the new process) and training to increase skills and motivation to perform well (Bowen, 1986, Meuter *et al.*, 2005). Damali *et al.* (2016) studied how training and education programs influenced the performance of recently diagnosed diabetic patients in their diet planning and glucose monitoring tasks. Identifying the optimal level of CP through mathematical models is another approach supporting the reduction of operational challenges (Roels, 2014, Stokburger-Sauer *et al.*, 2016).

Prevention steps can mitigate much of the risk but not all problems can be anticipated. This requires some allowance for accommodation. Accommodation involves "buffering," putting extra resources in place to absorb the problematic situations arising from customers' differing levels of interest and ability, their penchant for showing up at inconvenient times, or their potential opportunistic behavior (Frei, 2006, Wirtz and McColl-Kennedy, 2010, Secchi *et al.*, 2019). Airport ticket kiosks and stations that require customers to perform their own baggage

check-in still require staff to help those unaccustomed to, inept at, or physically incapable of completing the tasks. This buffering incurs ongoing costs to prevent mis-performance or to reduce the chances of service failures. Operational risk accommodation also includes the ongoing costs of monitoring customer performance. For example, there is a thriving industry that provides systems that help retailers detect fraud and shoplifting in self-checkout lines. Customer mis-performance accommodation should also be extended to include continuous improvement initiatives that use failures and service recovery incidents to indicate where design changes or further mitigation steps are needed (Tax *et al.*, 2006). Ultimately, accommodation also includes the ongoing costs of service recovery for those incidents that occur despite mis-performance prevention and process buffering measures.

In some circumstances, a firm may determine that some customers represent especially high risk in assuming a higher-participation role (Tax *et al.*, 2006, Breidbach *et al.*, 2016). Staff in a service accommodation role may step in to take over the customer's task, such as assisting elderly customers handle heavy baggage in airport check-in situations; medical services may deem some patients as inappropriate for self-management. This customer screening represents one instance where steps to mitigate one form of risk may incur greater risk in another: while excusing some customers from using a higher-participation alternative can reduce operational risk, it may increase market risk if there is a negative public reaction to the firm's basis for the screening.

4.3 Network risk mitigation

Network risk mitigation aims at reducing potential negative impacts where increased CP creates shifts in other organizations' roles. When increasing CP roles, a firm needs to consider potential

impacts on suppliers and network partners and take steps to curb potential negative outcomes. While service research has studied the network uncertainties and risks associated with higher levels of CP, it has provided limited insights about their mitigation (Akkermans and Vos, 2003, Kim *et al.*, 2007, Hibbert *et al.*, 2012, McColl-Kennedy *et al.*, 2012, Tax *et al.*, 2013, Pinho *et al.*, 2014, Harvey, 2016).

The supply chain management field provides some relatable insights. This research stream has focused on managing the firm's risk posed by its dependence on suppliers (Zsidisin and Ellram, 2003, Craighead *et al.*, 2007, Chopra and Sodhi, 2014). In changing the service process, the firm may create higher risk for its suppliers that, in turn, poses risks for the firm.

The framework developed by Zsidisin and Ellram (2003), rooted in agency theory, groups supplier risk management techniques into two categories, akin to operational risk mitigation techniques: behavior-based (prevention) and buffer-oriented (accommodation). The first category boosts the supplier's preparedness while the second category involves the firm's deployment of extra resources to cushion the impact of a supplier-related failure.

These approaches are directly applicable to the CP context. The first method, mapping onto the behavior-based category of Zsidisin and Ellram (2003), is either to constrain customer behavior (e.g., through closed technology standards), or improve the partner's capabilities (e.g., through supplier training programs). Constraining customer behavior may be as simple as the firm directing its customers when or through what channel to use the partner's services, helping to reduce the unpredictability of such demand (Alexander *et al.*, 2017). On the capabilities side, the firm can mitigate risk by improving suppliers' demand forecasting by providing more complete and timely customer data. The second, buffer-oriented category entails steps to accommodate variability, such as by adopting contracts that are more flexible. This allows

suppliers to manage potential variability they may face in demand or in customer requirements. This approach may be taken in conjunction with the firm itself absorbing some of the variability, shielding the supplier from disruption by maintaining skills and extra materials in-house. Alternatively, the firm may develop its employees' competence and increase the system's flexibility to allow workers to deal with unexpected supplier shortcomings (Secchi *et al.*, 2019).

Besides the firm's suppliers, greater participation may also affect the service delivery network "partners" that customers choose to bring into the process. Without the firm having the levers available for mitigating risk as it does with its direct suppliers, it must absorb more of the risk associated with this indirect supplier network (Tax *et al.*, 2013). Generating higher levels of engagement among network partners could help reduce this risk (Brodie *et al.*, 2019). If customers can choose complementary service providers, the firm needs to build its system to accommodate potential variety or, alternatively, find ways to actively constrain customer choice (for instance, with closed technology standards, as Apple does with its iTunes platform) (Hibbert *et al.*, 2012, McColl-Kennedy *et al.*, 2012). In the medical context, some minor surgeries performed as outpatient procedures depend on the patient not only being properly prepared (fasting, taking medication in advance, etc.) but also supplying materials needed for the procedure and recovery (bandages, pharmaceuticals). Specifying to patients the best sources of support and working with pharmacies to create appropriate supply packs mitigates the risk that surgeries have to be cancelled because patients mis-perform due to their reliance on other service providers.

5 Total Cost of Customer Participation Risk

Taking into account the potential sources of risk helps assess the potential mitigation steps and their costs. However, not all "wrong scenarios" can be anticipated, nor can all those anticipated

be prevented. To make a more complete assessment of the net benefit in increasing the customer's role, the firm also needs to assess the impact of situations where prevention steps do not work.

More thorough and effective mitigation steps will reduce the expected losses represented by the outlined risks. There will likely be some residual failure costs from mis-performance incidents. The *total cost of CP risk* that should be considered is the sum of the costs of mitigation (prevention + accommodation) steps plus the expected costs of the residual failures.

Note that "costs" likely extend beyond strictly monetary ones: qualitative impacts and customer perceptions may be difficult to predict and measure but must still be projected and considered (Feigenbaum, 1956, Juran, 1962, Crosby, 1979). The firm can assess the direct costs of monitoring and accommodating customers' actions; however, much of the market risk in increasing CP derives from the uncertainty in how customers will assess the new value proposition. Given the phenomenological nature of value, projecting the impact of a change on customer loyalty or the firm's reputation is difficult to quantify. However, firms should recognize that such downside implications should be forecast, quantified to the extent possible and considered in the planning of increased participation alongside the anticipated direct risk mitigation costs.

To assist in such an analysis, this paper offers a tool that provides a systematic approach to assessing the costs that should be considered before increasing the firm's CP role. The next section presents the risk assessment tool, developed to help guide a process for identifying potential risk sources and prompt consideration of possible mitigation steps to counter them. To demonstrate its application, the tool is then applied to the case of a hospital changing the customer's role in renal dialysis treatment.

6 Customer Participation Risk Assessment Tool

The risk assessment tool in Table 1 allows managers to weigh the implications of a service design that involves increased customer inputs. The first step is to consider all customer input categories to identify those that will see increased demands. For each type of risk (i.e., market, operational and network), the assessment should:

- Identify potential sources of risk by input type
- Assess the level of risk that each represents
- Identify possible risk mitigation practices that can be implemented
- Assess the total costs of implementing chosen mitigation steps as well as those of likely failures that such steps may not prevent.

As the assessment tool indicates, estimating the level of risk is facilitated by considering its primary components: the proportion of customers who are likely to be affected and the typical magnitude of the negative impact. That negative impact may apply to the customer, the firm or other providers. The level of risk is the product of these two components. Estimating the level of risk for each input change can signal which elements should be the focus of risk mitigation.

[Insert Table 1 here]

The tool has been shown to be valuable by assessing a current project involving increased CP: the move by a hospital department to have dialysis clinic patients adopt home dialysis treatment. Home dialysis requires that a patient undergoes minor surgery to install a soft plastic

tube in the abdomen but, once healed, the patient can have a machine installed at home that allows daily dialysis to be completed there during sleep or while doing stationary activities. This eliminates the need to be treated in the hospital. The patient's participation entails a more complicated procedure compared to undergoing in-clinic dialysis. This includes self-administering the process plus equipment cleaning and maintenance. However, health practitioners consider that there is a significant relative advantage in not having to make frequent trips to the hospital for the same procedure.

A series of interviews were conducted with a team of nurses responsible for a clinic in an urban hospital in Wisconsin, USA, that offers both in-hospital and home dialysis services. The team has sought to increase the adoption rate of the latter, which they feel has been slow. The nurses provided information to illustrate how the risk assessment tool can be applied. The resulting table and corresponding process has proven to be helpful to the nurses, who are trying to understand how to manage the higher-participation process effectively, particularly the resistance to its adoption (see Table 2).

[Insert Table 2 here]

Step 1 - Identify Sources of Market Risk and Complete a Risk Assessment

To identify market risk associated with changes in any of the customer input categories, managers can use a variety of methods. These include customer research, current databases of customer preferences, managerial judgment and comparisons to comparable changes in the past. As portrayed in Table 2, the nurses know roughly what proportion of patients are concerned about adopting home dialysis and added to their understanding with interviews of potential

candidates. Specifically, they found out that dialysis patients are often elderly and are worried about their own skills, perceiving that home dialysis tasks could be too complicated and that making mistakes might have severe consequences. In addition, some patients have concerns about how to rent or purchase specific equipment or perceive setting up the proper support technologies (electrical supply and internet connection, etc.) as difficult to the extent of being overwhelming. Others see the development of a support network as difficult. Nurses also mentioned that a small group of patients lacked confidence in their ability to make proper decisions because of their health condition. Ultimately, the magnitude of possible negative impacts if things went wrong is a major factor in patients not purchasing the service.

Step 2 - Identify Market Risk Mitigation Practices

In this case, patients can readily see the value of switching to the high-participation service; market risk stems primarily from patients' fears about task performance requirements and secondarily about having adequate equipment and personal support networks. The nursing team addressed the perceived complexity issue through an extensive education and training process where they demonstrated how to use the technology. Then the patient used the technology at the hospital under supervision before using the technology at home under supervision. The hospital staff provided information on ways to obtain necessary support, encouraging potential patients to widen their circles of friends or family who could assist with the home dialysis treatment. Nurses acknowledged that some patients are poor candidates for home dialysis and the clinic keeps the existing option available.

Step 3 - Identify Sources of Operation Risk and Complete a Risk Assessment

Operational risks can be identified through internal quality data or by using analysis techniques such as process mapping or service blueprinting. No formal technique had been used in this case but, based on their experience, nurses identified task performance – not conducting the treatment properly – as the major mis-performance threat. Also cited as risk sources were maintenance of equipment, a duty of the patient and home caregiver, and developing an adequate support network, since the patient has to have at least one person available to assist or call for help if needed.

In this case, applying this tool points to where further analysis should be performed. Operational risk stems from a low proportion of failure among the adopters but the potential impact is very high, since mis-performance can threaten a patient's safety. The clinic team should review problem incidents to determine more precisely the roots of mis-performance risk. In particular, they can assess whether it stems from patients' failure to perform the treatment properly, from their lack the skill or motivation to maintain the equipment or from their difficulty in obtaining reliable personal support.

Step 4 - Identify Operation Risk Mitigation Practices

The focus in this case was on reducing as opposed to accommodating risk. The clinic implemented a training program to qualify patients for home dialysis, hence lowering the likelihood of mis-performance. This training was intended to both increase patient skills and their feelings of self-efficacy, thereby increasing their motivation to adopt the service. Data about past mis-performance incidents informed the staff how to better target the training.

The equipment suppliers who provide the home dialysis devices have worked to simplify the patient's role in performing the treatment, monitoring the state of the device and

automatically communicating any problems through alarms and signals to the clinic. While these improvements greatly reduced the skill requirements, they did not address the necessary motivation component. The clinic team has built into the training programs elements that stress the consequences of non-compliance and steps to take to avoid triggering alarms.

For the risk associated with a patient lacking an adequate support network, there is no option to reduce the requirements; instead, the only mitigation strategy is accommodating patients by arranging visits from hospital staff and social workers. This mitigation practice reduces operational risk by limiting mis-performances but increases network risk by adding complexity to the hospitals' service delivery network. As with almost any form of accommodation, this step comes with significant costs.

Step 5 - Identify Sources of Network Risk and Complete a Risk Assessment

The hospital has a contract with a provider of home dialysis devices that supplies both the apparatus and the required medication. The supplier has a direct relationship with the patient. While the hospital has no say in the product design, making it harder to implement task-simplification procedures, it is still largely responsible for the patient experience. The nurses highlighted this intermediation as a major risk in offering a home dialysis option.

This is an example of where increased CP entails a supplier's greater involvement in the service delivery, shifting power to it and exposing the provider to increased supply risk. This arrangement increases supplier power as well as negatively affects market risk. Once the patients become accustomed to operating a specific device and have a relationship with the supplier, the hospital could be locked in with the supplier while patients' loyalty to the supplier

could lead them to choose to receive the service from a competing facility that uses the same firm.

Step 6 - Identify Network Risk Mitigation Practices

The nurses offered little in terms of mitigation practices for network risk other than a close relationship with both patients and suppliers to ensure that they could constantly monitor the service. The supply chain management literature points to diversifying supply as a risk mitigation strategy. The hospital could use two different suppliers and assign different patients to each. This is not a choice that is usually made by hospitals, as it would result in significantly increasing operational complexity.

Step 7 - Assess the Total Cost of Risk Mitigation + Cost of Failure

The final stage of the process is assessing the cost of the selected mitigation strategies and the cost of failures still projected to occur. This should be done holistically since, as seen in this situation, steps to mitigate one form of risk might increase another.

In this case, while the cost of risk mitigation steps (such as hiring extra staff for home visits or augmenting the training program) could be straightforward, the service provider cannot easily quantify the cost of failures that may entail catastrophic health outcomes. Given the need to minimize failures completely, the approach may be to set the target for this component as zero. The staff could then compare costs of projected risk mitigation steps to the proportion of patients who could be safely migrated to the higher-participation home dialysis alternative when those steps are implemented. The clinic staff recognizes that a segment of dialysis patients are high-risk candidates for this procedure and as an accommodation, the in-hospital service process

must be maintained. Setting up appropriate monitoring systems could provide a means of assessing the effectiveness of specific trial mitigation steps as well as their costs, allowing the staff to judge how much to expend on risk mitigation, balanced against the resulting proportion of patients who could be safely migrated to the home dialysis procedure. Of course, the monitoring system itself must be recognized as a risk mitigation cost that would need to be factored into the analysis.

7 Contributions to Practice

This paper offers service designers and managers insights by providing a more complete picture of the construct of CP risk. First, since increasing CP will inevitably present the firm with greater exposure to unwanted consequences, the model helps guide managers in assessing and preparing for possible negative outcomes. Importantly, it points to mitigation tactics for specific risk categories, distinguishing between those that prevent *versus* those that accommodate negative outcomes. This is particularly valuable, as the extant literature has focused on identifying benefits and costs of CP with little attention to how to address performance issues (e.g., Jaakkola and Aarikka-Stenroos, 2015; Mustak et al., 2016; Frei, 2008). The simultaneous consideration of CP from strategic, operational and marketing perspectives enhances the value to managers tasked with optimizing the entire system.

Second, the proposed model helps managers recognize that mitigating one type of risk can lead to an increase in another type. This is an advance from the current view of considering benefits and costs independently (e.g., Bendapudi and Leone, 2003; Scherer et al., 2015). Consider the example of channel proliferation: leaving established channels in place may reduce the market risk of customer defections but at a cost of coordinating and integrating increasingly

complex multi-channel systems. Conversely, steps to reduce operational risks by providing thorough instructions or training for customers may increase market risk if customers view the added steps as onerous. Placing restrictions on which service co-providers customers can use may reduce the associated network risk but, again, may increase market risk.

Third, although risks are difficult to quantify, managers have to take into account the probability and potential costs of "wrong scenarios." In addition, managers should also calculate the trade-off between the expected costs of those risks and the cost of mitigation steps they might choose. While it might appear that risk assessments can be derived objectively, concepts such as cost, quality, and risk combine objective elements with significant subjective components. As a result, the model presents an interesting methodological challenge in that risk in customer participation and its mitigation is a complex phenomenon.

Note that the choices are framed in terms of the risks to the firm. However, the assessment should extend beyond that to consider risk external to the firm. Service system designers may be tempted to install changes that please customers and improve conditions for the firm but harm other network entities, society or the environment. As societal views change over time, some choices may increase in market risk as the acceptability of those externalities decreases for many customers.

One ubiquitous example is seen in some shopping mall food courts: fast-food vendors have long relied on using disposable containers, napkins and utensils to co-opt customers into clearing their own tables, increasing CP at the expense of municipal refuse systems that have had to absorb tons of unsorted, single-use materials. Some mall managers have recently tried to promote recycling for this material and increased the customers' role by requiring them to sort leftover items into different receptacles. However, widespread customer mis-performance in the

form of sorting errors or deliberate non-compliance led to the recycling streams being contaminated. For the food court managers, "doing the right thing" in voluntarily meeting recycling standards confronts significant operational risk with customers failing to complete their role properly. Without taking recycling's value into consideration, a risk assessment would probably lead to the abandonment of such design changes. Instead, many sites have added to their costs by *reducing* CP, taking back responsibility for clearing food court tables to mitigate the recycling contamination problem. Implicitly, the managers have weighed the values of the externalities in conjunction with the additional costs of operational risk mitigation (that is, trying to get customers to perform properly) to justify the absorption of a traditional customer role. There is clearly room to expand the model to add consideration of external impacts and the possible interplay of customers' acceptance of their role in the service process and changing social norms that may influence their behavior.

8 Contributions to Theory and Future Research Directions

This paper responds to calls to address the issue of risk in CP in services (e.g., Mustak *et al.*, 2016). By developing a comprehensive, cross-disciplinary model, this paper contributes to the understanding of the potential risks associated with increasing CP requirements in service delivery. While the managerial implications section is derived from the proposed conceptualization of CP risk and provides some implications for theory development, additional contributions to research are next highlighted.

The extant literature largely considers the potential costs of increased CP as a set of independent elements (Damali *et al.,* 2016; Frei, 2006). The classification of risk into three distinct, yet related, categories is an important contribution as it reinforces the need to consider

CP decisions and customer experience design from a systems perspective (Patricio *et al.,* 2011; Kwortnik and Thompson, 2009). This is particularly evident considering the potential ways that firms could attempt to mitigate one form of risk could increase the risk of another. Using the model in the field underscored the need to consider risk management holistically, taking into account all of the categories simultaneously in weighing the tradeoffs introduced by any risk mitigation step.

The introduction of network risk as a central component of CP risk is significant as it ties CP more closely into contemporary thinking around customer journey design which highlights the importance of network partners impact on customer experience (Lemon and Verhoef, 2016; Tax *et al.,* 2013). Considerations of network risk, a potential source of problems lying beyond the dyadic customer – service provider interactions, has not been effectively addressed in assessing the impacts of CP.

In developing the model, it was found that different fields had proposed similar principles for managing operational risk (e.g., Fiegenbaum, 1956 in quality control; Zsidisin and Ellram, 2003 in supplier management); although each has its own terminology, their approaches rely on considering the tradeoffs in supporting risk mitigation steps *versus* the costs of absorbing any unmitigated negative outcomes. This common, underlying perspective serves well in modeling a CP risk management process and can support further research in this domain.

The service management field has viewed service failure from the perspective of the service provider failing to meet the customer's expectations. Some researchers (e.g., Tax *et al.,* 2006, Frei, 2006) have pointed out how service managers must also deal with instances where the customer fails to meet the service provider's expectation; however, the explication and terminology for this problem is less well developed than those for service provider failures. The

term customer mis-performance is introduced as a label for the actions of customers who knowingly or unknowingly fail to fulfil their roles within expected parameters – even if they are completely satisfied by their experience. It is important to establish a specific term for a potential major source of risk that a firm faces in increasing CP in its service design. This will assist in designing strategies to prevent customers from negatively affecting the service system (Tax *et al.,* 2006).

The proposed model also helps generate important research questions, prompting testable propositions for investigating contemporary topics such as the sharing economy, service networks and experiential services (Field *et al.*, 2018), three topics that are frequently associated with increased CP. The following discussion offers examples of future research questions.

8.1 Sharing Economy

New information platforms have facilitated business ventures such as Uber and Airbnb that form part of the "sharing economy," also referred to as collaborative consumption or peer-to-peer markets (Penn and Wihbey, 2015). Such ventures afford people easy access to available service capacity in lieu of requiring individual ownership (Matzler *et al.*, 2015).

These business models blur the roles of customer, service provider, and asset owner, requiring an increase in participation for each player, creating different uncertainties and risks for each of them (Sundararajan, 2013). A sharing economy firm faces additional market risk in that its reputation is affected by the performance of its large and diverse group of independent service providers. Participant rating systems mitigate risk by motivating both service providers and customers to perform their roles effectively (Penn and Wihbey, 2015). The business model may generate increased complexity, uncertainty and risk, increasing the scope for different types of

failures. Specifically, customer or service provider misbehavior might prove contagious and lead to co-destruction of value for service system participants (Harris *et al.*, 2010, Carù and Cova, 2015, Prior and Marcos-Cuevas, 2016). Witness, for example, the recent problems faced by Uber from allegations of sexual assault perpetrated by its drivers (Warzel and Bhuiyan, 2016).

The framework in this paper provides a starting point for analyzing potential risks of sharing-economy business models with the following questions:

- What types of market and operational risks do the various parties introduce into sharing economy business models? How do risks for the platform manager, the service provider and the end customer compare to those in traditional services?
- Are different risk mitigation strategies available for sharing-economy businesses and do they differ depending on the model?
- Since the roles of owner, service provider and customer are blurred, how are the risks shared and how should failures be recovered?

8.2 Service Networks

Service networks are increasingly common in the wake of rising customer expectations for highly customized services (Hibbert *et al.*, 2012, McColl-Kennedy *et al.*, 2012, Tax *et al.*, 2013, Harvey, 2016). A service firm may establish networks through formal alliances or the network may be unique to the particular customer who uses the firm in conjunction with other services (Tax *et al.*, 2013). In either case, either formal or *ad hoc* networks can experience service failures. One research question is whether there is a difference in operational uncertainty and risk arising from network characteristics such as who designs and coordinates the network. For example, in some cases, the customer is the network coordinator, choosing the various service

providers and integrating their activities; in other cases, one service provider assumes the coordinator role and may specify the other network contributors. In the latter case, each party's roles and responsibilities may become blurred. In addition to operational risk, the attribution of responsibilities for failure can vary significantly among different network structures, which may increase the market uncertainty and risk. Some important research questions are:

- Does the networked service's locus of coordination moderate the success of different mitigation strategies? What is the impact of the service delivery network's complexity on risks and mitigation practices?
- Do a service provider's efforts to mitigate its own customer-participation risk (such as guarding against opportunistic behavior) expose network partners to negative consequences? Can a network partner reduce its own risk by pushing the burden of customer uncertainty to another member of the network?
- What are the risks associated with information asymmetry among network partners? For example, an online retail platform such as Amazon might have information about its customers that it does not share with the sellers and can use it to influence customer behaviors.

8.3 Experiential Services

The term "experiential services" has been progressively broadened to include any service concept that is concerned about the customer's emotional response before, during, and after the service encounter (Pine and Gilmore, 1999, Schneider and Bowen, 1999, Berry *et al.*, 2002, Helkkula, 2011). The CP risk model could be used in analyzing the potential risks for experiential services that face comparatively higher heterogeneity (and thus uncertainty) in

customer preferences and the related risks of dissatisfaction and defection that might be magnified by their emotional components. Future studies could examine the following research questions about experiential services:

- Do services with high versus low levels of emotional engagement face different types of uncertainty? Are they exposed to different levels or types of risk?
- Do mitigation strategies differ in their effectiveness based on the service concept's experiential content?
- In experiences with high emotional content, how do behavioral and physical cues offered to customers (servicescape, signs and symbols, tangibles, layout, ambiance) impact uncertainty and risk?

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Figure 1. Conceptual model of customer participation risk

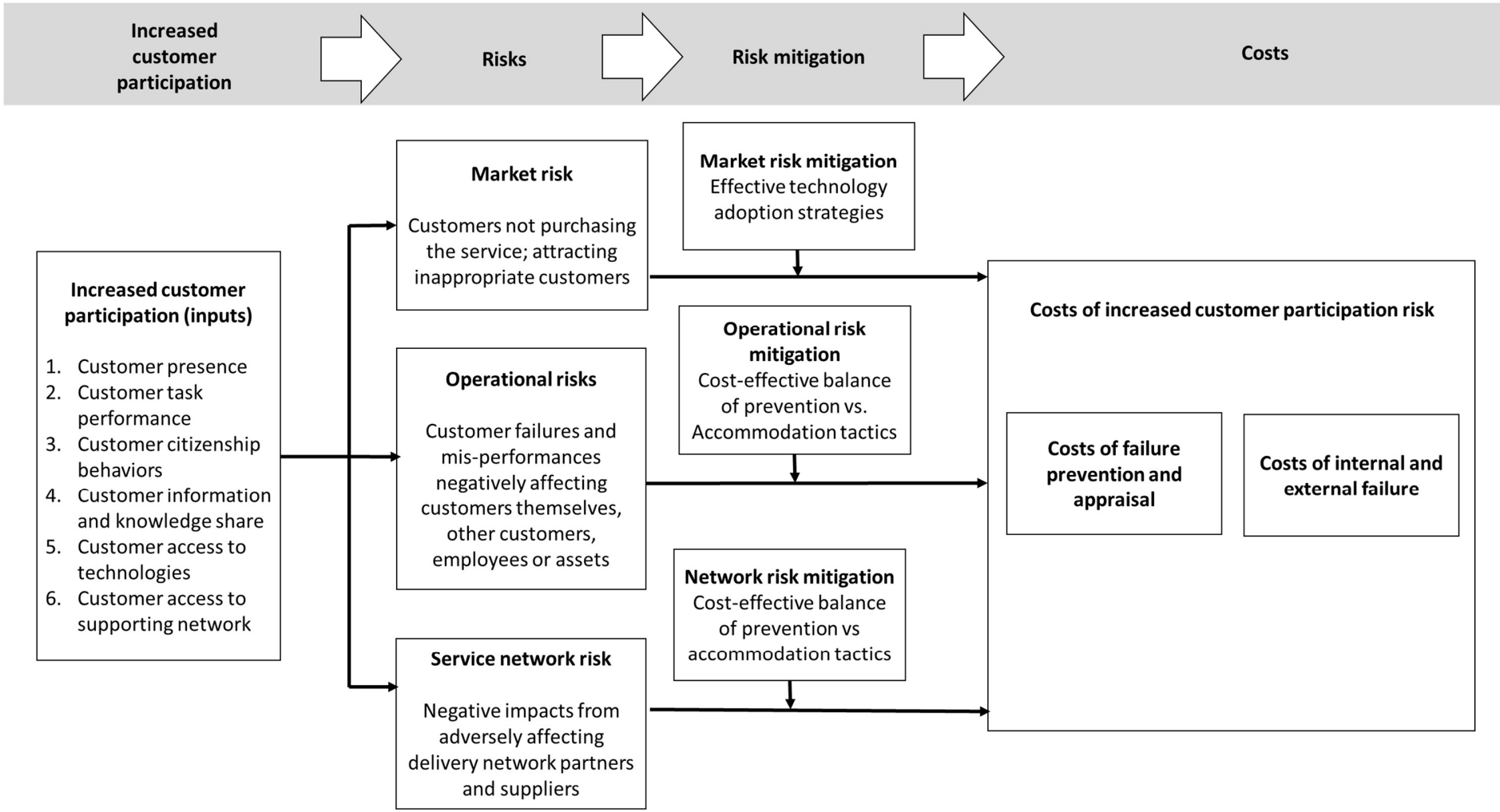

Table 1. Customer Participation Risk Assessment Tool

Step 1		Step 2			Step 3	Step 4
Market Risk: What might customers view as less favorable than current practice or make them hesitant to adopt the change?						
Customer Input Category	Issue (if relevant)	Risk Assessment: Proportion of Target Customers Concerned	Risk Assessment: Magnitude of Typical Negative Impact	Risk Assessment: Overall Risk	Risk Mitigation Options	Cost mitigation and failure
Physical Presence		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Task Performance		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Information Sharing		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Knowledge / Decision Sharing		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Cooperative Behavior		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Tools and Technology		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Support network		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Internal Operational Risk: What might a customer lack (including motivation) to perform the role effectively?						
Customer Input Category	Issue (if relevant)	Risk Assessment: Proportion of Target Customers Concerned	Risk Assessment: Magnitude of Typical Negative Impact	Risk Assessment: Overall Risk	Risk Mitigation Options	Cost mitigation and failure
Physical Presence		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Task Performance		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Information Sharing		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Knowledge / Decision Sharing		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Cooperative Behavior		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Tools and Technology		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Support network		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
External Operational Risk: What elements may change conditions for the firm's suppliers or the customers' supporting networks?						
Customer Input Category	Issue (if relevant)	Risk Assessment: Proportion of Target Customers Concerned	Risk Assessment: Magnitude of Typical Negative Impact	Risk Assessment: Overall Risk	Risk Mitigation Options	Cost mitigation and failure
Physical Presence		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Task Performance		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Information Sharing		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Knowledge / Decision Sharing		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Cooperative Behavior		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Tools and Technology		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		
Support network		Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High	Low ☐ ☐ ☐ ☐ ☐ High		

Table 2. Risk assessment for home dialysis service

Market Risk: What might customers view as less favorable than current practice or make them hesitant to adopt the change?

Customer Input Category	Issue (if relevant)	Risk Assessment			Risk Mitigation Options	Cost mitigation and failure
		Proportion of Target Customers Concerned	Magnitude of Typical Negative Impact	Overall Risk		
Physical Presence		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Task Performance	✓	Low □ □ □ □ ✓ High	Low □ □ ✓ □ □ High	Low □ □ □ ✓ □ High	Keep the old system and communicate risks and benefits of required task performance	
Information Sharing		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Knowledge / Decision Sharing	✓	Low ✓ □ □ □ □ High	Low ✓ □ □ □ □ High	Low ✓ □ □ □ □ High	Communicate risks and benefits of required decision sharing	
Cooperative Behavior		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Tools and Technology	✓	Low □ ✓ □ □ □ High	Low □ □ ✓ □ □ High	Low □ □ ✓ □ □ High	Provide support to access technology	
Support network	✓	Low □ ✓ □ □ □ High	Low □ □ ✓ □ □ High	Low □ □ ✓ □ □ High	Provide support to access support network	

Internal Operational Risk: What might a customer lack (including motivation) to perform the role effectively?

Customer Input Category	Issue (if relevant)	Risk Assessment			Risk Mitigation Options	Cost mitigation and failure
		Proportion of Target Customers Concerned	Magnitude of Typical Negative Impact	Overall Risk		
Physical Presence		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Task Performance	✓	Low □ ✓ □ □ □ High	Low □ □ □ □ ✓ High	Low □ □ □ □ ✓ High	Simplify (mistake proof) the technology, train and educate patient, and keep nurses ready to help	
Information Sharing		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Knowledge / Decision Sharing	✓	Low □ ✓ □ □ □ High	Low □ □ □ ✓ □ High	Low □ □ ✓ □ □ High	Train and educate patient, and keep nurses ready to help	
Cooperative Behavior		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Tools and Technology	✓	Low □ ✓ □ □ □ High	Low □ □ □ ✓ □ High	Low □ □ □ ✓ □ High	Train and educate patient, and keep nurses ready to help	
Support network	✓	Low □ ✓ □ □ □ High	Low □ □ □ ✓ □ High	Low □ □ □ ✓ □ High	Train and educate patient, and keep nurses ready to help	

External Operational Risk: What elements may change conditions for the firm's suppliers or the customers' supporting networks?

Customer Input Category	Issue (if relevant)	Risk Assessment			Risk Mitigation Options	Cost mitigation and failure
		Proportion of Target Customers Concerned	Magnitude of Typical Negative Impact	Overall Risk		
Physical Presence		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Task Performance		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Information Sharing		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Knowledge / Decision Sharing		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Cooperative Behavior		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		
Tools and Technology	✓	Low □ ✓ □ □ □ High	Low □ □ ✓ □ □ High	Low □ □ ✓ □ □ High	Allow patients to work with only one supplier, and make the communication between supplier and patient visible to nurses, in case of glitch nurses can help immediately	
Support network		Low □ □ □ □ □ High	Low □ □ □ □ □ High	Low □ □ □ □ □ High		