

# **Service Mega-Disruptions: A Conceptual Model and Research Agenda**

## **Abstract**

**Purpose-** This paper formally conceptualizes service mega-disruptions as any far-reaching and unforeseen general environmental stressor or threat that impacts a service organization's ability to provide a desired level of service. The authors differentiate sudden large-scale general environmental threats from traditional service failures in (1) scope and scale of impact via number of customers and sectors affected and (2) duration and speed of the disruption.

**Design/methodology/approach-** This paper draws from service recovery theory to build a conceptual model of service mega-disruptions. The resulting conceptual model maps service failure recovery strategies against a service mega-disruption recovery approach to examine consumer response to changes in service value. This work further articulates additional research needs including conceptualization, measurement, and methods as traditional drivers of service recovery and the value of the service experience change in response to service mega-disruptions.

**Findings-** This work proposes a research agenda to investigate whether service mega-disruptions can bypass the need for service recovery due to a consumer self-moderating process. As past research shows, the less control a service provider has over a failure, the more customers attribute fault to the situation and transfer blame away from an organization. This paper suggests that this self-moderating process disrupts the need for service providers to court forgiveness for a failure with perceptions of (1) similarity and (2) controllability providing an alternate pathway to customer forgiveness. Similarly, it is suggested that service mega-disruptions play a role in transforming service ecosystems into tighter, more contractual systems with less agency for service providers and poorer ability to adjust to market conditions. The duration and longevity of

effects on service providers' control, agency, and ability to adjust following a service mega-disruption must be researched further.

**Originality-** This paper builds theory to develop a conceptual model of service mega-disruptions and their role in customer engagement and reshaping the service ecosystem. This paper culminates in the proposition of a research agenda that aims to build research capacity among services marketing scholars as service providers' coordination and market conditions are challenged by service mega-disruptions.

**Keywords-** Service mega-disruption, service ecosystem, service failure, service recovery, customer responses, customer forgiveness

**Classification-** Article: conceptual paper

## Introduction

This paper formally introduces and conceptualizes service mega-disruptions as any far-reaching and unforeseen general environmental stressor or threat that impacts a service organization's ability to provide a desired and expected level of service. These macro-level general environmental stressors include, but are not limited to, wildfires, storms, hurricanes, earthquakes and other climate-change driven disruptions, terrorism and wars, economic and political actions, and pandemics, epidemics, and health emergencies (Campbell, Inman, Kirmani, and Price, 2020; Chisholm, Ellison, Evans, Lee, Lieberman, Pavlik, Ryan, Salter, Stini, and Worthman, 1993; Mittal, Griskevicius, and Haws, 2020).

Mega-disruption events can interrupt transit and trade routes, reduce access to basic goods and services, lead to fluctuations in supply and demand that impact product availability, reduce capacity to provide essential and luxury services, and drive insufficient staffing for hospitality and services sectors. Mega-disruptions reach across industries and sectors, and occur in any largely uncontrollable and threatening event in the current environment (Campbell *et al.*, 2020), from economic and political to health, climate, and mortality stressors. Consider for example, widespread wildfires in western Canada in 2023 which upset oil and gas operations causing gas prices to rise, reduced available timber harvests driving up lumber prices, dampened the tourism industry, disrupted corporate travel, and imposed pressure on the national health system (DePillis, 2023).

Precisely how service failure and recovery functions, how customer responses are affected, and how service ecosystems respond and react to these large-scale disruptions is at present unknown and unclear. Thus, consistent with the theme of the special issue, this work endeavors to develop new theoretical explanations of a service exchange, namely service mega-

disruptions. This work is necessary and relevant as there is a documented rise in disruptions widely affecting service ecosystems necessitating the ability of service providers to adaptively respond to service delivery failures (Bloomberg, 2022; Gallardo, 2021; Lawrence, Hossain, Jaradat, and Hamilton, 2020). The primary goal of this research is to identify innovative propositions to guide service research and practice as service delivery response is reevaluated in the context of changing market structures and conditions (Cronin, 2021; Cronin and Nagel, 2020), with both theoretical and practical contributions identified in a series of research opportunities.

The first research objective is to develop the notion of service mega-disruptions based on an examination of service failures across the service ecosystem (micro-, meso-, and macro-levels inclusive). The second research objective is to advance a conceptual model of service mega-disruptions, facilitating a critical analysis of the key areas of services scholarship and prominent service concepts that must be reevaluated as these macro-level mega-disruptions challenge service provision across the globe. The emergence of service mega-disruptions tests current conceptualizations of key services constructs in ways that necessitate additional research on effects, measurements, and methods (Cronin, 2021). Thus, the third research objective is to craft propositions related to the reevaluation of traditional drivers of service recovery, customer responses, and emotional effects resulting from mega-disruptions. This also involves understanding how service ecosystems are altered in the wake of market changes caused by service mega-disruptions, with a set of research opportunities (Figure 1, Table 2) serving as a guide for future research on this topic. The paper concludes with a discussion of the theoretical implications and research imperatives for advancing scholarship on mega-disruptions in services.

## **Theoretical Background**

Following the United Kingdom's separation from the European Union during Brexit in 2020, truck driver shortages limited availability of goods across hospitality and retail sectors (Gallardo, 2021). Similarly, more than 80% of the United States' basic organic chemical capacity was offline and faced reduced capacity for months as Texas entered an unexpected Arctic deep freeze in 2021. This led to price pressures and scores of product shortages in a range of intermediate and consumer goods (Federal Reserve Bank of Dallas, 2021). In 2022, Hurricane Ian decimated Florida's citrus crops, impacting global exports of fruit and threatening cotton, soybean, and tobacco production. In addition, major transit networks were submerged, interrupting freight and shipping, and costing the economy more than \$100 billion, the largest hurricane loss in the state's history (Bloomberg, 2022). Climate change also intersected with Russia's war in Ukraine to worsen energy shortages and increase costs of food and electricity in Europe (Bloomberg, 2022). Product availability stemming from unplanned and uncontrollable environmental stressors impacts sectors from retail and hospitality to B2B providers in manufacturing, cascading into the service environment in the form of mega-disruptions.

In this paper, the concept of service mega-disruptions is extended from a focus on disruptions caused by the COVID-19 pandemic (Kabadayi, O'Connor, and Tuzovic, 2020) to any far-reaching and unforeseen general environmental stressor or threat that impacts a service organization's ability to provide a desired and expected level of service, such as extreme weather events, political actions, and health emergencies. Table 1 charts some examples of service mega-disruptions and their impacts.

-- Insert Table 1 here--

To generate theory around service mega-disruptions and construct a conceptual model and roadmap for future research directives, salient constructs and their relationships are summarized in the following sections (Meredith, 1993). First, the service ecosystem, composed of multiple levels including micro, meso, and macro is examined (Akaka, Vargo, and Lusch, 2013; Beirao, Patrício, and Fisk, 2017; Chandler and Vargo, 2011; Frow, McColl-Kennedy, Hilton, Davidson, Payne, and Brozovic, 2014). Micro interactions refer to exchanges between individual actors, such as firms and customers (Akaka et al., 2013; Chandler and Vargo, 2011; Frow et al., 2014). The meso-level represents exchanges between multiple actors (Chandler and Vargo, 2011; Frow et al., 2014), and at a macro-level, the micro- and meso-level interactions are integrated (Akaka et al., 2013). These interactions can include exchanges within the regional market (Frow et al., 2014) or include exchanges on a national and global scale (Akaka et al., 2013).

This research suggests that service failure at the macro-level can occur on a wide enough scale to generate mega-disruptions. However, existing research on service failures has focused primarily on individual service failures that occur at a micro-level (e.g., Keiningham, Morgeson, Aksoy, and Williams, 2014; Wang, Wu, Lin, and Wang, 2011) and group service failures that occur at a meso-level (e.g., Albrecht, Hattula, Bornemann, and Hoyer, 2016; Du Fan, and Feng, 2014; Xu, Wang, Wang, and Xue, 2020), with service failures on a macro-level (that exceed the impact of individual and group service failures) remaining largely neglected. As a result, little is known about service failures with a macro-level impact on the service ecosystem (Mustak and Ple, 2020). Thus, to build theory towards macro-level service failures and mega-disruptions,

existing research on the other levels of the service ecosystem (micro and meso) will be examined first.

### ***Service Failures Across the Service Ecosystem***

#### ***Individual (micro-level)***

In this section, the literature on service failure and service recovery is developed to illustrate foundational service concepts on micro-level effects. The predominant approach to service recovery is that organizational responses to service failures are triggered by customer complaints (Voorhees, Fombelle, Gregoire, Bone, Gustafsson, Sousa, and Walkowiak, 2017), with service failure and recovery researchers primarily examining service performance that falls below customers' expectations (Smith, Bolton, and Wagner, 1999) from an exchange theory perspective, with the view that loss of a resource (e.g., money or time) should be offset with a similar resource (i.e., monetary compensation; e.g., Roschk and Gelbrich, 2014).

Generally speaking, service failures can be categorized as process or outcome failures. Process failures occur during the performance of the service when the way the service is delivered fails to meet customer expectations. Outcome failures occur when the final output received from the service fails to fulfil customer expectations (Smith, Bolton, and Wagner, 1999). For instance, a process failure occurs when there is excessive waiting time at a café, and an outcome failure when a customer receives the incorrect drink. A process failure involves a symbolic exchange associated with social resources, translating to a loss in social resources such as self-esteem and social status (Smith et al., 1999; Surachartkumtonkun, Patterson, and McColl-Kennedy, 2013). An outcome failure involves a utilitarian exchange that is more closely associated with economic resources (Luo and Mattilda, 2020). When customers experience an

outcome failure, it generates a loss in economic resources such as money and time (Smith et al., 1999; Surachartkumtonkun et al., 2013).

Based on these different types of exchanges, the type of service failure determines the success of recovery strategies. For instance, positive employee attitudes that restore social resources, such as warmth (Huang, Zhang, Gursoy, and Shi, 2020), apology (Roschk and Kaiser, 2013; Smith et al., 1999), and politeness (Borah, Prakhya, and Sharma, 2020) are more effective responses for process failures. In contrast, recovery strategies such as employee competence (Huang et al., 2020), compensation, and recovery speed (Smith et al., 1999) are most effective in restoring economic losses, thus more effective for outcome failures.

Relatedly, service failure magnitude measures the customer's perception of the failure severity through the size of the loss incurred (Smith et al., 1999). The higher the perceived loss, the more severe the customer's perception of service failure magnitude (Weun, Beatty, and Jones, 2004). Perceived service failure magnitude is subjective, however, as every individual measures the degree of loss differently (Smith et al., 1999). While perceptions of service failure magnitude vary among customers, some failure contexts can drive shared perceptions. Keiningham et al. (2014) investigate service failure magnitude in airlines to show how major incidents inflicting physical harm, such as injuries or death, are perceived to be more severe than minor non-catastrophic incidents, such as delays and lost baggage.

The magnitude of service failures also moderates customer responses to the failure (Smith et al., 1999; Wang et al., 2011). As the perceived magnitude of service failure increases, customer satisfaction (Smith et al., 1999; Weun et al., 2004) and loyalty (Craighead, Karwan, and Miller, 2004; Wang et al., 2011) decreases, while switching intention increases (Riaz and Khan, 2016). Perceived service failure magnitude impacts customer satisfaction with recovery

efforts, indicating the need for service recoveries that correspond to the size of the loss (Harris, Mohr, and Bernhardt, 2006; Weun et al., 2004).

As suggested by the wide application among existing studies, the failure type and magnitude approach to service failures are both well-established in the service literature. However, researchers have generally overlooked the overall scope of a service failure. Most seminal work on service failures highlight its definition and conceptual dimensions and focus primarily on service failures that occur at a micro-level (Bitner, 1992; Oliver, 1980; Parasuraman Zeithaml, and Berry, 1985; Smith et al., 1999). As a result, many studies on service failures are limited to the interactions with individual customers at a time.

### ***Group (meso-level)***

It is important to distinguish between individual and group service failures as they can trigger different affective and behavioral responses (Albrecht et al., 2016; Du et al., 2014; Xu et al., 2020). Thus, meso-level failures are next considered to develop an understanding of group responses to service delivery failures and recovery.

A group service failure can be classified as a meso-level failure (Akaka et al., 2013; Chandler and Vargo, 2011; Frow et al., 2014) as it involves multiple customers simultaneously (Albrecht et al., 2016; Du et al., 2014; Xu et al., 2020). The perception of a group service failure stems from the awareness that the same failure is affecting other customers at the same time. This knowledge is attained by being in the mere presence of other customers experiencing the same failure (Albrecht et al., 2016) or communicating with other customers through face-to-face (Du et al., 2014) or online interactions (Xu et al., 2020). Group service failures are often studied

in an airline context as service failures that simultaneously affects all passengers (e.g., delays, cancelations) are common (Harris et al., 2006).

Although research on group service failure is still relatively nascent, this scope of failure has become more prevalent in the contemporary service environment. This is largely attributed to the rapid growth in e-commerce, which has introduced unique service failures (Forbes, Kelley, and Hoffman, 2005). These include Customer Relationship Management (CRM) system process and platform failures, delivery delays, shipment errors and misleading online information. Such e-commerce failures have the potential to affect groups of customers simultaneously, as all customers will be exposed to the same e-commerce platform which, in most cases, is the source of failure. Moreover, the wide adoption of the Internet and online platforms facilitate communication between customers via social media and online communities (Xu et al., 2020), rendering group service failures more salient among customers.

In the current work, this initial surge of insight into group-level service failure is accelerated and the concepts and processes involved in macro-, systems level service failures are introduced. Importantly, this research seeks to drive theorization around the changing roles of consumer and provider interactions and the affective and behavioral responses that characterize large-scale service mega-disruptions.

### ***Mega-disruptions (macro-level)***

This section illustrates mega-disruptions in service, classified here as macro-level service failures. Service mega-disruptions are characterized by four key aspects: massive scale, wide scope involving multiple stakeholders, unforeseen nature, and recovery difficulties (Kabadayi et al., 2020). First, service mega-disruptions induce market disturbances on a massive scale that

transcend geographic boundaries. Campbell et al. (2020) map a series of widespread disruptions that can threaten consumer well-being, from natural disasters and disease threats to rapid economic and technological changes. Actual and perceived threats from health, economic, social, informational, and environmental domains affect consumer security and induce responses in both consumer and market or institutional level (Campbell et al., 2020). Due to widespread over-capacity and under-demand, or under-capacity and over-demand, the global impact of service mega-disruptions is tremendous (Kabadayi et al., 2020).

The second characteristic of service mega-disruptions is that they simultaneously affect multiple stakeholders within the service ecosystem (Kabadayi et al., 2020; Mustak and Ple, 2020). Service ecosystems consist of interdependent relationships between different industries who collaborate to co-create value (Akaka et al., 2013; Beirao et al., 2017; Frow et al., 2014). In other words, any major changes in the demand or supply of one service industry can simultaneously affect other service industries that are reliant on one another. In some cases, this can lead to marketplace adaptations such as adjustments to normal organizational processes (Campbell et al., 2020). The industry level impact reaches down to customers and end-consumers through the concept of ‘nestedness’ (Mars, Bronstein, and Lusch, 2012). These relationships are characterized by complexity, chaos, and non-linear, systemic interdependencies (Capra, 1997). When actors cannot, or do not interact across levels (micro, meso, and macro), as is arguably the case with service mega-disruptions, the ecosystem collapses, negatively affecting service performance for end consumers.

The third key aspect of service mega-disruptions is that they are caused by unforeseen events that arrive unexpectedly and spread rapidly (Kabadayi et al., 2020). Threat-induced disruptions impact customers no matter their source, whether the disruption be financial and

economic, health or physical, or to routines and practices (Campbell et al., 2020; Cronin, 2021; Phipps and Ozanne, 2017). Macro-level environmental stressors carry extrinsic risks as uncontrollable events that can threaten either survival or well-being (Chisholm et al., 1993; Mittal et al., 2020). As a result, these disruptions manufacture uncertainty and “could stem from economic uncertainty (e.g., stock market volatility, recession, job loss), societal uncertainty (the future state of one’s country or the world), mortality uncertainty (e.g., terrorism, new disease epidemic), or anything in the environment that poses a threat to future well-being (e.g., wildfires, hurricanes)” (Mittal et al., 2020, pg. 353).

The final characteristic of service mega-disruptions is its long-term impact on the economy which makes it difficult to recover (Kabadayi et al., 2020). Differing from long-term impacts of more predictable disruptions (e.g., climate change induced gradual temperature changes; Kahn, Mohaddes, Ng, Pesaran, Raissi, and Yang, 2021), the unpredictable nature of mega-disruptions (e.g., COVID-19 global pandemic) makes planning, preparation for, and thus recovery from more challenging. The economic impact tends to be enduring, depending on the duration of mitigation efforts, scarcity, and uncertainty (Das, Jain, Maheswaran, Slotegraaf, and Srinivasan, 2021).

### **Model of Service Mega-Disruptions**

The aforementioned pool of literature on service failures across the service ecosystem is drawn on to build the conceptual model of service mega-disruptions illustrated in Figure 1. This model summarizes theory around service mega-disruptions and identifies a roadmap for future research via formal, testable propositions (Meredith, 1993). For completeness, the model identifies three components: the lower half illustrates the traditional service failure approach via

recovery (evidenced in most micro and meso-level failures), the upper half illustrates the alternative service mega-disruptions approach via the consumer self-moderating process proposed in the current work, and thirdly, resultant consumer outcomes driven by emotional and decisional forgiveness are also presented.

As shown in Figure 1, research on traditional service failures suggests the interconnected nature of forgiveness and service recovery (e.g., Harrison-Walker, 2019; Tsarenko and Tojib, 2012). As forgiveness refers to the process of changing an individual's internal reaction to a more positive one, despite the fact that the individual has been harmed by others (McCullough, Bono, and Root, 2007), its relevance to service recovery is evident. Customer forgiveness is a constructive response to service failure that is gaining importance in service recovery research (Babin, Zhuang, and Borges, 2021; Casidy and Shin, 2015; Harrison-Walker, 2019). Yet, in this model, it is suggested that not every service failure needs recovery, and that forgiveness may be achieved in the absence of recovery.

The alternative approach proposed in this paper is represented in the upper half of the model, where service mega-disruptions can bypass the need for recovery due to a consumer self-moderating process involving perceived similarity and perceived controllability. That is, some failures are of such a nature that the organization need not court customer forgiveness with recovery efforts. Based on the theorization of service concepts, it is suggested that this self-moderating process drives the relationship between service mega-disruptions and emotional forgiveness.

The third part of the model represents the proposed relationship between emotional forgiveness and decisional forgiveness on consumer responses to the market structure changes of

service mega-disruptions. Key service recovery variables are illustrated in the customers' behavioral responses word-of-mouth (WOM), complaint, re-patronage, and switching intentions.

--Insert Figure 1 here--

Most studies show that forgiveness for a service failure can only be achieved by reducing the injustice gap experienced by customers through recovery strategies (Casidy and Shin, 2015; Harrison-Walker, 2019; Worthington and Scherer, 2004). As a result, other ways of achieving forgiveness for service failures remain unexplored. With the emotional contagion effect magnifying the negative affective and behavioral responses in group service failures (Du et al, 2014; Du et al, 2019; Xu et al., 2020), service mega-disruptions would be expected to generate negative outcomes on a greater scale given the massive scope of the disruptions. However, this paper suggests that this may not always be the case, thus necessitating the exploration of new recovery strategies unexplored in current literature to facilitate this new phenomenon.

## **Research Agenda**

In this section, three service concepts that are challenged as a result of the rising frequency and scope of service mega-disruptions in an increasingly interconnected global economy are identified (see Table 2). The conceptual model summarized in Figure 1 reveals that service mega-disruptions differ from traditional conceptualizations of service failures as they create a unique situation which can involve high perceived similarity and low perceived controllability. Service mega-disruptions are often novel and unexpected as they are triggered by unprecedented events such as the global pandemic COVID-19, extreme weather events such as

spontaneous wildfires, and the shock of sudden war (Campbell et al., 2020; Kabadayi et al., 2020). Therefore, it is reasonable to conclude that service mega-disruptions stimulate the reinterpretation of a service incident for both customers and service providers, reverberating through the service ecosystem (Mustak and Ple, 2020). This is suggested to evoke an array of emotional and behavioral responses for customers that differ from those elicited in traditional service failures on an individual (micro) or group (meso) scale.

Service mega-disruptions challenge the conceptualization of key services concepts and necessitate additional research on measurements and effects (Cronin, 2021). This includes a reevaluation of traditional drivers of service recovery, how customers respond to service failure, and how service ecosystems are altered in the wake of service mega-disruptions. The sections that follow develop a clear set of research opportunities and related research propositions (Cronin, 2021; Cronin and Nagel, 2020) as the role of existing service options is reevaluated in the context of changing market conditions and service mega-disruptions. Three prominent service concepts; service recovery, customer responses (as driven by notions of forgiveness), and service ecosystems are discussed in the context of service mega-disruptions, with scope for reinvestigation given the rise in disruption scale and scope. First, the paper considers potential changes to the traditional drivers of service recovery stemming from service mega-disruptions.

-- Insert Table 2 here--

### ***Service Recovery***

The process of service failure and recovery diverges depending on which level of the service ecosystem the failure occurs. Similarity perceptions diverge for service mega-failures as

opposed to individual (micro) and group (meso) level service failures in part because deep-level similarities and resultant psychological closeness can be perceived between a customer and a service provider when both experience the same unexpected environmental stressor or shock. Deep-level similarities can be observed in psychological characteristics such as personality traits, values, and attitudes (Bell, 2007). Such similarities can be established through shared experiences (Phillips, Northcraft, and Neale, 2006). Surface-level similarities emerge in demographic characteristics such as age, gender, and ethnicity (Bell, 2007), and include incidental similarities in trivial characteristics such as a shared birthday or birthplace (Jiang, Hoegg, Dahl, and Chattopadhyay, 2010). Construal level theory (Liberman and Trope, 2014; Trope, Liberman, and Wakslak, 2007) informs perceptions of similarity based on how psychologically close a customer feels to a service provider experiencing a service mega-disruption. Thus, it is suggested that in the aftermath of a service mega-disruption that stems from a shared experience, individuals experience heightened similarity and psychological closeness.

Attribution theory has been widely used in service failure literature as customers actively engage in causal attribution to find out why a failure occurred (Hess, 2008; Folkes, 1984). This attribution of blame shapes both affective and behavioral responses (Folkes, Koletsky, and Graham, 1987; Weiner, 1985). Perceived causes of failure can be classified into stability, locus, and controllability (Folkes, 1984; Weiner, 1985). Stability measures the likelihood of the failure recurring, from temporary and unstable to a permanent cause that is a stable source of failure. Responsibility for the failure varies from an internal locus caused by customer-related issues to external locus stemming from the firm. The third causal dimension is controllability, which refers to the firm's control over the cause of the failure. Customers perceive a higher level of

control when they believe the firm could have prevented the cause of the failure, whereas a low level of control or no control is perceived when the cause of the failure is attributed to an external event.

Among these causal dimensions, controllability is most relevant to service mega-disruptions. Seminal work on attribution in the service context shows that high controllability perceptions evoke negative emotions such as anger (Folkes, 1984; Folkes et al., 1987) and dissatisfaction (Bitner, 1990), decreasing re-patronage intentions and increasing complaint intentions (Folkes et al., 1987). This suggests that negative responses to service failures can be replaced by favorable responses when customers perceive the cause of the failure to be beyond the service provider's control. Thus, low controllability, such as when a service failure occurs in the context of uncontrollable weather, economic, or health-related mega-disruptions, should not yield negative responses.

It is suggested that this combined effect provides an alternate pathway to forgiveness, in which service failure recovery efforts are not necessary or are ineffective. During this process customers gain awareness that a service mega-disruption was caused by an uncontrollable general environmental stressor or threat that affected both the service provider and themselves in a similar way. Collectively, these insights lead to research opportunities (RO1-RO3) and associated critical propositions to advance service mega-disruption research, as shown in Table 2.

The second service area ripe for reconceptualization; customer responses, is explored next. This section considers how service mega-disruptions could alter customer emotional and behavioral responses, via forgiveness.

## *Customer Responses*

Customers' emotional responses toward providers during service mega-disruptions are theorized to diverge from traditional service failure in terms of empathy, sympathy, and emotional forgiveness. The critical analysis that follows describes key ways in which customer responses (even with failure to deliver on an anticipated service) can be altered in the wake of service mega-disruptions.

Previous research drawn from the field of psychology shows that empathy evokes responses with both cognitive and affective dimensions (Batson and Shaw, 1991; Houston, 1990). The cognitive response of empathy involves adopting the perspective of another individual to gain awareness of their circumstances. This cognitive awareness shapes the affective response of empathy, which is associated with sharing the emotional experience of another individual. Wan and Wyer (2019) find that even incidental similarity of a shared surname increases customer empathy towards a service provider during a service failure. If surface-level similarities such as incidental and demographic similarities stimulate customer empathy, it is reasonable to expect that deep-level similarities with greater value, such as shared experiences (Phillips et al., 2006), generate the same or greater levels of empathy. Individuals tend to have higher levels of empathy towards others with a similar cultural background (Johnson, Simmons, Jordan, Maclean, Taddei, Thomas, Dovidio, and Reed, 2002) and similar cultural values (Nelson and Baumgarte, 2004). Customers experiencing service mega-disruptions are likewise anticipated to have high perceived similarity with service providers due to the shared experience of a large-scale disruption. Service mega-disruptions have the potential to evoke greater feelings of empathy through perceived similarity.

Emotional responses toward providers during service mega-disruptions also diverge from traditional service failure in terms of sympathy. In attribution theory, Weiner (1980) posits that negative events attributed to uncontrollable factors generate feelings of sympathy within victims. This suggests that the perception of controllability influences feelings of sympathy. While there are varying interpretations, researchers agree that sympathy is a reflection of positive feelings and concerns for another individual's unfortunate situation (Eisenberg, 2000; Strelan, Karremans, and Krieg, 2017). Unlike empathy, sympathy does not require an individual to adopt the perspective of another individual and absorb their emotions (Eisenberg, 2000). Thus, sympathy is elicited simply by gaining cognitive awareness of another person's circumstances.

Albrecht et al. (2016) find that customers experience higher levels of sympathy towards service providers when they perceive the service failure to be uncontrollable. With service mega-disruptions driving perceptions of uncontrollability due to an uncontrollable event, customers can be expected to be more sympathetic towards the effects. This does not however suggest that end-customers face the same loss or experience the same affective response toward product shortages or lack of access to basic and/or desired goods (see Table 1) following a service mega-disruption. Instead, following a wildfire, storm, war, pandemic, or political conflict, for example, customers who understand that service providers are enduring the same disruption may be more likely to view resultant service failures with greater sympathy.

Researchers agree that sympathy plays a key role in achieving emotional forgiveness (Strelan et al., 2017; Takada and Ohbuchi, 2013; Worthington and Scherer, 2004). From this, customers can be expected to feel more sympathetic towards service providers when they encounter a service mega-disruption that is caused by an uncontrollable event. Studies in the service context also demonstrate that customers are more likely to respond to service failures

with forgiveness when they are empathetic towards the service employees (Wieseke, Geigenmüller, and Kraus 2012; Yagil and Luria, 2016).

Drawing on such insights, it is theorized that service mega-disruptions can lead to emotional forgiveness through heightened levels of empathy. In other words, when customers become aware that a service mega-disruption was triggered by an unanticipated general environmental stressor or event such as a global pandemic, the outbreak of a war or the arrival of a storm, they feel more empathetic towards the service provider. These feelings of empathy are driven by the fact that the customer has also experienced, or is currently experiencing, the repercussions of the same crisis. As a result, customers may respond with emotional forgiveness towards a service mega-disruption. Based on this reflection, Table 2 presents an opportunity for research (RO4) and offers a series of propositions to stimulate the examination of customer emotional responses to service mega-disruptions.

Given that emotional forgiveness reverses negative emotional responses (Giammarco and Vernon, 2014; Worthington and Scherer, 2004), the opposite can be true for subsequent behavioral responses towards service mega-disruptions. In other words, the positive emotional responses of sympathy and empathy drive decisional forgiveness through positive behavioral outcomes (Tsarenko and Tojib, 2011; Worthington and Scherer, 2004). Some of the most widely studied response behaviors in the service failure context include intent to spread negative WOM, complaints, switching, and re-patronage (Harrison-Walker, 2019; Kalamas Laroche, and Makdessian, 2008). These four behaviors are also associated with decisional forgiveness towards service failures (Harrison-Walker, 2019; Tsarenko and Tojib, 2012). Thus, driven by feelings of emotional forgiveness, decisional forgiveness towards service mega-disruptions is expected to be reflected through lower intent to spread negative WOM, complain, or switch to another provider,

as well as higher re-patronage intentions. See Table 2 for a further discussion of this research opportunity (RO5) and associated propositions.

The next section assesses how ever larger scope, scale, duration, and frequency of a service mega-disruption impact warrants researcher attention. Following this, the full services ecosystem is examined as the third prominent service concept challenged by service mega-disruptions.

### ***Scope, Scale, and Duration in Service Recovery and Customer Responses***

This section continues to examine the core service concepts of service recovery and customer responses, exploring limits to effects in the context of service mega-disruption. It is suggested that changes to the scope, scale, duration, and frequency of service mega-disruptions alter perceptions of similarity and controllability between individuals and service provider, which threaten recovery during a service mega-disruption.

The global microchip shortage that stemmed from the COVID-19 pandemic and resultant lockdowns in China was exacerbated by a fire at a Japanese chipmaker and an Arctic freeze in Texas that took 70 power plants offline (Shankland, 2022). The chip shortage thus lasted years and spread to impact nearly every firm with an electronic offering, from automakers to gaming and electronic devices, appliances, and even medical goods such as pacemakers (Shankland, 2022). The widespread disruption of the microchip shortage represents one way that service mega-disruptions grow in duration, scope, and scale to challenge recovery from service mega-disruptions (Figure 1). Waitlists for certain vehicles powered by semiconductors extend into 2024 as demand for gaming systems and shortages in new appliances challenge consumer patience (Preston, 2021). With no clear end to the duration of the service mega-disruption and

many sites of disruption emerging across the globe, theorization suggests that customers perceive less similarity and more controllability for service providers caught in the microchip disruption (Lieberman and Trope, 2014). Thus, it can be expected that the less customers perceive similarity and more they perceive controllability, even in a service mega-disruption such as the microchip shortage, the less sympathy and empathy intervenes to moderate the impact of related service failures.

Once a general environmental stressor triggers a service mega-disruption, customers initially evaluate their affective and behavioral responses. Because these stressors and events tend to disrupt the individual consumer along with the service provider (Campbell et al., 2020), customers are more likely to construe greater psychological closeness and similarity during the initial onset of a service mega-disruption. That is, immediate responses result in a closer more contextualized response that heighten perceptions of similarity (Trope et al., 2007). Yet, service mega-disruptions are by their very nature characterized by their large scope and scale and by an immediate, but possibly continuing, duration. Individuals should thus perceive greater psychological distance and construe less perceived similarity (Trope and Liberman, 2010) with a service provider as the mega-disruption grows temporally far and the duration of the disruption increases (one month vs. one year), as it grows spatially far (nearby vs. foreign), more socially distant (more vs. less economic power), and even as the disruption's source occurs probabilistically less (more vs. less frequent occurrence).

The greater the temporal duration, the less perceived similarity customers are likely to feel towards the service provider, resulting in less empathy following a mega-disruption. Similarly, the greater the spatial distance from the onset or place in which a general environmental stressor occurred, the less perceived similarity a customer is anticipated to feel for

a service provider affected by the service mega-disruption. Likewise, the more socially distant a customer feels from a service provider (for instance, near vs. distant identity or loyalty to a service provider) and the more probabilistic and more often a service mega-disruption occurs, the less similarity a customer feels. These factors, in turn, lower empathy for service failure even during and in the aftermath of a service mega-disruption. In these cases, self-moderated service recovery is hindered without sufficient perceived similarity to yield automatic forgiveness. Table 2 identifies a research opportunity (RO6) and associated indicative propositions to test these limits of customer forgiveness.

Controllability perceptions can predict greater sympathy as customers attribute service failures to external events. However, perceptions of the uncontrollable nature of events are also at risk for service mega-disruptions that continue to grow in scope, scale, and duration. In service mega-disruptions, customers are temporarily highly aware of the situational cause for a service failure. That is, the situational reason behind a failure such as a hurricane, pandemic, or the outbreak of a war or political or economic crisis is highly visible, often discussed, and tends to disrupt not only the service provider but the customer as well (Gilbert and Mallone, 1995). Although duration, scope, and scale can eventually occlude the source of the service mega-disruption, either as the news cycle and social media coverage moves on via temporal distance or the widening scope means immediate and felt impacts to the customer lessen. In this way, attributions that an uncontrollable situation drives a service mega-disruption (Gilbert and Mallone, 1995) are anticipated to fade with duration and increased scope and scale.

It is suggested that over time and through increased scope and scale of a mega-disruption, customers are less likely to view situational constraints as the source of a service failure. Instead, customers can be expected to view the service provider as the source of the blame and tend to

discount the situation in the external marketplace that yielded the service disruption. The longer the duration and the greater the scope and scale of a service mega-disruption, the more likely a customer is to view a service provider as having a greater degree of control over a service failure. When perceptions of controllability increase, customer sympathy decreases, likely impacting service recovery as presented in the final research opportunity in consumer responses (RO7) and the critical propositions pertaining to customer responses in Table 2.

This is a particularly salient warning for the conceptualization of customer responses and service recovery in service mega-disruptions stemming from climate change and weather events. As climate change accelerates, effects become more predictable or include more ability to be planned for (Lieberman and Trope, 2014), which can change how mega-disruptions stemming from climate events are perceived. In 2022, a logjam of hundreds of freight ships in the falling Mississippi River meant delayed shipments and a halt to trade in grains, fertilizer, metals, and petroleum (Bloomberg, 2022). Yet, the river had been near historic low levels, a result of drought from climate change that the U.S. has faced on and off and may face until 2030 (Borunda, 2022).

Similarly, as the increased prevalence of wildfire smoke and other climate change-driven health issues are clearly documented, employers need to be proactive and plan ahead when it comes to workforce health. As wildfires and smoke can travel hundreds of miles, this blurs the lines between what happens within and outside the workplace (Varley, 2023). Conversations around indoor air circulation and filtration driven by the COVID-19 pandemic for example, must now encompass outdoor air quality as well. In addition, fire reduction strategies such as cutting power to reduce wildfire risks should also be planned for. In this way, long-term effects that move further away from the onset of the service mega-disruption and the expanding scope of

impact to other parts of the services ecosystem are anticipated to increase perceptions of controllability for service providers caught in such long-duration and more anticipated mega-disruptions. These challenges to interactions in the service ecosystem form the last prominent service concept considered in this work. Service mega-disruptions can impact service providers' control, agency, and ability to respond to changes in market structure.

### ***Service Ecosystem and Interactions***

Of the three prominent service concepts to be challenged by the rise of mega-disruptions, the service ecosystem is considered in this section. It is imperative that scholars examine the interactions and constraints on service providers facing these outsized disruptions to effective delivery of service. Service ecosystems have been conceptualized as being loosely coupled and self-adjusting, which affects all nested tiers (micro, meso, and macro; Vargo and Lusch, 2016; Mustak and Ple, 2020). However, service mega-disruptions reveal limits to this view, as breakdowns can take the form of more tightly coupled and rigid interactions with greater mutual dependency.

Tightly coupled interactions are more likely to leave service providers with limited agency and ability to respond to changing market conditions (Danneels, 2003; Mele, Nenonen, Pels, Storbacka, Nariswari, and Kaartemo., 2018). This does not bode well for service providers' ability to respond effectively in the face of a mega-disruption. As recent scholarship suggests: "Tightly coupled interactions among some actors in the subsystem may ripple through the larger service ecosystem and affect the nature and intensity of the interactions among other actors" (Mustak and Ple, 2020, pg. 404). Service mega-disruptions occur at the macro level of the nested service ecosystem, and the effects flow downward. This can affect the level of control and

agency of service providers. Lack of control and agency feature in service mega-disruptions and may characterize the ability of actors within the affected service ecosystem to adjust.

In this way, adjustments to changing marketplace conditions are not automatic. This lack of agency is anticipated to spread from events at the macro-level and has the potential to calcify the formerly loosely coupled arrangements that describe service ecosystem actors, from suppliers and wholesalers to the customers' typical approach to their chosen service provider. In non-disruptive service ecosystems, loose coupling means suppliers and wholesalers are capable of adjusting to changes and share mutual trust for outcomes (Vargo and Akaka, 2012). Likewise, in non-disruptive service ecosystems, changes are often taken in stride by end consumers who conduct business with their preferred service providers and carry certain expectations for service delivery. In loosely coupled arrangements, consumers choose where, when, and how they interact with their preferred service provider. That freedom of choice and agency creates a normative contract drawn from relational norms.

The moment agency is removed and the coupling is rendered apparent and more contractual during a service mega-disruption, the service ecosystem can be suddenly transformed. The ecosystem in a mega-disruption shows a tendency to move from fluid functioning and trust built on normative contracts into a more brittle, harder-line arrangement as service components fail and providers find they cannot deliver needed inputs, goods, services, and support from the macro-level on down. When deadly 100-year floodwaters ravaged New Zealand in 2023, flooding its major international airport and sending stranded passengers fleeing to higher ground, airlines were initially slow to respond (1News, 2023). Flights continued to take off for Auckland despite the forecast and delivered passengers to flooded terminals. Weeks later, forecasts for the deadly Cyclone Gabrielle revealed an altered response as hundreds of domestic

and long-haul flights were cancelled ahead of the cyclone's arrival. Cancellations at the beleaguered Auckland international airport with already reduced capacity from earlier flood damage rippled outward, sowing mass confusion as customers across the globe were unsure of flight operations, unable to rebook, and advised not to even attempt to use airline contact centers for service recovery (RNZ, 2023). The service ecosystem's mutual dependence tightened as service providers lost agency and flexibility following this service mega-disruption. This climate-driven mega-disruption affected more than 592 flights from Air New Zealand alone, and it took months for the 35,000 affected Air NZ passengers to rebook or gain restitution following the mass cancellations.

Reverting to a focus on contractual obligations or the failure to meet such obligations during a service mega-disruption may vastly diminish ecosystem responsiveness and relational norms (Mustak and Ple, 2020). It remains unclear, however, for how long following a mega-disruption and for how many levels and actors within the nested tiers a service ecosystem loses its normative, soft contract flexibility and ability to adjust to changes. How far-reaching and how long-lasting or permanent are changes to responsiveness, agency, and relational norms for an ecosystem that has experienced a service mega-disruption? It may be possible that different types and sources of service mega-disruption (i.e., health, economic, social, political, informational, climate, and/or technological; see Table 1) ripple through service ecosystems in distinct ways, leading to divergent impacts for control and agency of service providers. This analysis shows the possible role of service mega-disruptions in transforming ecosystems into tighter, more formalized, and contractual service ecosystems with poorer ability to adjust to changes. This suggests opportunities for future scholarly input (RO8-RO12) in these emergent areas of focus as outlined in more detail in Table 2.

Service mega-disruptions that interrupt the flow of goods and services within a given sector also render visible the shared institutional arrangements around which the ecosystem functions (Vargo and Lusch, 2016). For some actors and interactions in the disrupted service ecosystem, similar interpretation of the institutional arrangements may further facilitate rebuilding of mutual trust and normative relationships and interactions. Fiji Airways and American Airlines were among those who joined Air New Zealand in cancelling service to the Auckland international airport in the wake of the 2023 floods and before Cyclone Gabrielle's forecasted arrival. Images of thousands of passengers crowded into the upper floor of the flooded terminal buildings in January 2023, cut off from help by floodwaters over major ground transport routes and curled up in wet airliner blankets, propelled the airlines to take action ahead of another potential flood event (1News, 2023).

Yet, other actors in a service ecosystem facing a mega-disruption “might interpret, understand or apply institutional arrangements differently” (Mustak and Ple, pg. 405). Coordination within an ecosystem is aided by a shared view of the institutional arrangements. Reconfiguring or integrating resources to build value (Akaka and Vargo, 2015) is key following mega-disruptions that affect basic infrastructure and base materials. The consequences and potential downstream effects of divergent interpretations of institutions and arrangements in the ecosystem are in this way anticipated to determine how well a given service ecosystem itself can recover from a service mega-disruption. As a result, these final research opportunities (RO13 & RO14) and critical propositions are clearly formulated in Table 2.

## **Conclusion**

Customer and service provider interactions largely define the outcomes and continuance of service encounters. In the wake of changes in market structures that create service mega-disruptions, the conceptualization of the service experience is transformed. Researchers must examine what motivates future service encounters when the value that customers and service providers attribute to the service experience changes during service mega-disruptions (Cronin, 2021). Adjustments in service experiences as market conditions adapt or the market restructures during service mega-disruptions yield key reevaluations of service failure and recovery, customer responses, and coordination efforts in the services ecosystem.

In the present work, theoretical support is built for the concept of service mega-disruptions and research opportunities are identified to develop insights and findings for service scholarship assessing the impact of these large-scale marketplace condition and structural changes. Macro-level service mega-disruptions are formally differentiated from traditional service failures in (1) scope and scale of impact via number of customers and sectors affected, and (2) duration and speed of the disruption. Evidenced, for example by how the U.K.'s separation from the European Union had unintended impacts on service delivery, including limiting access to blood tests at medical laboratories and milkshakes and fried chicken at fast food outlets (Gallardo, 2021).

Insights provided in this research can assist in developing initial response strategies to facilitate these alternative routes for customer forgiveness. Based on the theorization in this paper, it is expected that making the macro-level impact of a service mega-disruption salient to the customer is an effective strategy for service providers in response to service mega-disruptions. For example, service providers could directly communicate messages including keywords such as 'similar', 'same experience', 'lack of control' or 'no control' to customers

during service mega-disruptions, or share news articles from credible media outlets reporting on the impact of the mega-disruption through statistics or objective interviews. These strategies should assist in reinforcing perceptions of similarity and low controllability, required to elicit feelings of empathy and sympathy towards the service providers, in turn bypassing the need for recovery efforts to obtain forgiveness.

However, the conceptualization of service recovery in light of service mega-disruptions warrants further research, and boundary conditions relative to the size, scale, scope, duration, and frequency need to be identified and investigated. Future research is required to verify the proposed model and propositions in Figure 1, and to further understand the duration of the effect given the type of environmental stressor or threat that triggers the service mega-disruption. Changes in perceived social distance, spatial distance, or probabilistic difference for example are anticipated to have such an effect.

Finally, as Table 2 shows, effects of mega-disruptions on service ecosystems form a clear research directive for services marketing scholars. This is because mega-disruptions spanning health, economic, social, political, informational, climate, and technological categories are only increasing. From the worldwide experience of a pandemic affecting mortality salience and interaction withdrawal, to interrupted trade routes, transportation challenges, and barriers from climate change-driven disasters such as wildfires and hurricanes, mega-disruptions clearly differ in terms of the underlying processes compared to micro- and meso-level service failures. This paper lays the foundation for understanding the mechanisms behind this process and calls for a critical examination of service concepts that need to be reinvestigated as service mega-disruptions continue to gain momentum.

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**Table I.** Service Mega-Disruptions by Type and Impact Category

Source: Authors own work

<b>Type of service-mega disruption</b>	<b>Examples</b>	<b>Disruptive impact potential</b>
Health	HIV/AIDS outbreak; COVID-19 pandemic; monkeypox outbreak; Ebola, cholera, and measles outbreaks	Mortality salience and threat of illness or death; social isolation and withdrawal from interaction with front-facing service providers; interrupted supply chains, fractured production lines, less shipping, labor shortages as employees become ill or seek safety in other sectors of economy
Economic	Brexit; global recession; financial bailouts; inflation	Interrupted free-flowing transit and trade routes; reduced or eliminated capacity to provide essential and/or luxury service; lack of product availability; lack of investment capital
Social	Terrorism; labor shortages; living wage disputes; work absenteeism; increasing societal inequality; social protests; labor union disputes	Price pressure, lack of product availability, fluctuations in supply and demand, inability to meet production and manufacturing goals; low or insufficient staffing for hospitality and services sectors
Political	Israel-Palestine conflict; Russian invasion of Ukraine; war; shifts in geopolitical power such as U.S., E.U. and China relations, or in the Indo-Pacific	Food shortages; energy shortages; blockades and economic sanctions; threat of death or injury and lack of access to basic goods and services; price pressure
Informational	Spread of conspiracy theories on social media; rise of misinformation	Supply chain disruption from false and misleading information; boycotts; health and labor carryover effects; political turmoil; market trading effects
Climate	Extreme weather events and shifts in climate patterns; bushfires in Australia & wildfires in Canada; Greenland's melting polar ice caps; rising sea levels in coastal areas; drought and the shrinking Mississippi River delta transit routes; extreme cold and hot such as Texas	Rising costs of raw goods, increased demand and/or decreased availability of items that accompany interrupted transit and trade routes; drop in manufacturing of affected fruits, produce and other raw materials; refineries and energy production offline; changing infrastructure investment

	Arctic Freeze (2021); increasing prevalence of major storms such as Hurricane Sandy (2012), Typhoon Hagibis (2019), Hurricane Ian (2022)	
Technological	Global microchip shortage; cybercrime and hacking of business data; limitations in demand forecasting	Reduced capacity for production, unmet demand, shortages in product and service essentials

**Table II.** Research Agenda

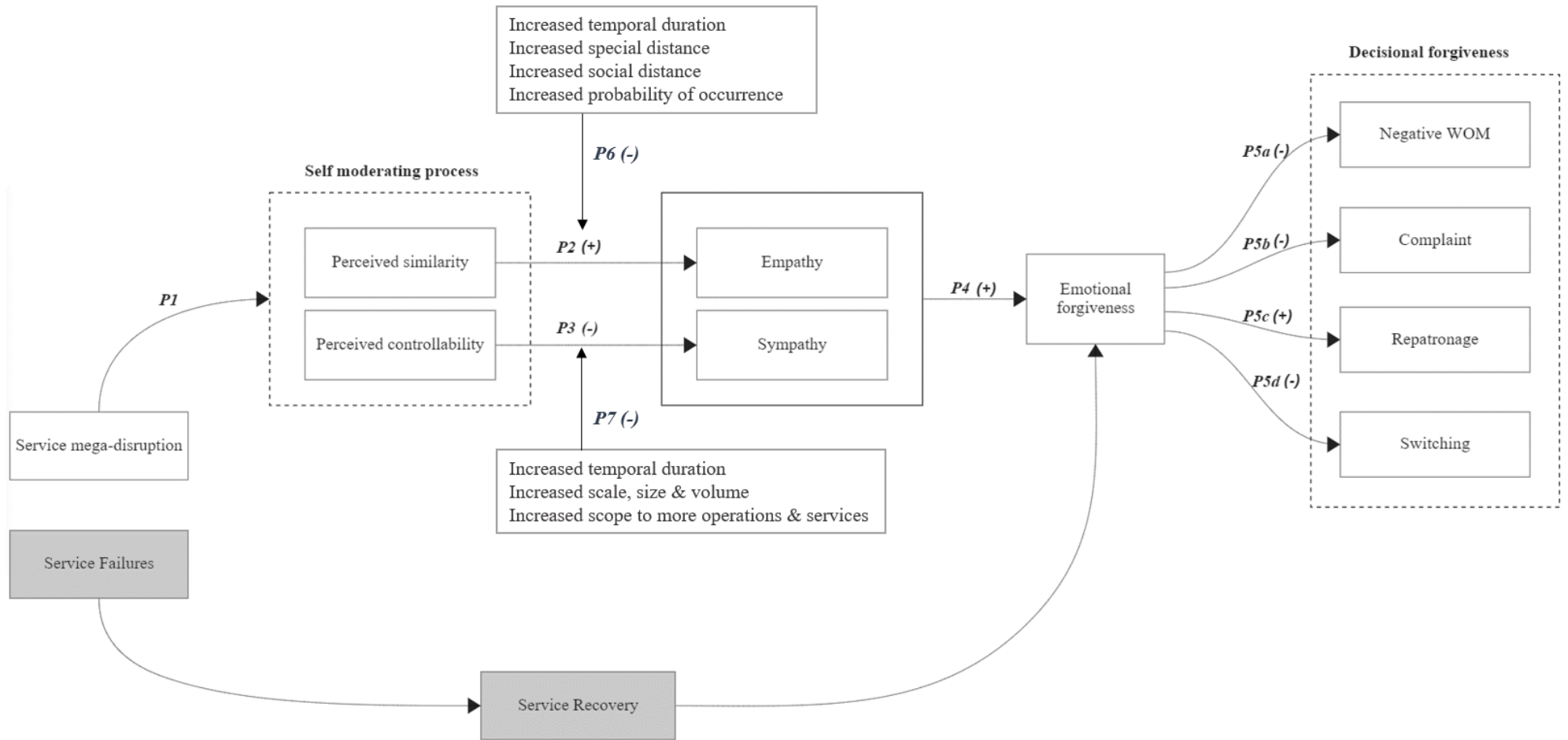
Source: Authors own work

<b>Prominent service concepts</b>	<b>Current state of research</b>	<b>Research opportunities</b>	<b>Propositions</b>
Service recovery	<p>Recently service recovery scholars have expanded to examine service recovery as a journey that involves multiple phases more aligned with the customer’s regular journey (including pre and post recovery) (Van Vaerenbergh, Varga, De Keyser and Orsingher, 2019).</p> <p>Service recovery transparency is also becoming more salient with an increasing shift of complaint behavior online (Honora, Chih, and Wang, 2022), and the emergence of chatbot service failure and recovery (Huang and Dootson, 2022).</p>	<p><b>RO1.</b> The traditional drivers of service recovery, including failure type and magnitude, need to be reinvestigated to determine their applicability in the context of service mega-disruptions.</p> <p><b>RO2.</b> Additional research is needed to better understand how changing market structures (including the form, location, and participants in the service journey) affect the role of consumer expectations, perceived value, and satisfaction in service delivery.</p> <p><b>RO3:</b> Additional research is needed to better understand the effects of changes in market structure caused by service-mega disruptions on consumer response variables.</p>	<p><i>Proposition 1: Consumers’ experiences of similarity and controllability of service providers are impacted by service mega-disruptions that drive changes to market conditions and structures. Customers may experience (a) higher perceived similarity and (b) lower perceived controllability when they interact with service providers during a mega-disruption.</i></p>
Customer responses	<p>In the service recovery literature, most prior research focused on</p>	<p><b>RO4:</b> Investigations into the divergent emotional responses that drive customer</p>	<p><i>Proposition 2: Service mega-disruptions have the potential to elicit feelings of empathy through a high perception of experiential similarity.</i></p>

	<p>customer satisfaction, trust, word of mouth, and behavioral intentions (e.g., Homburg, Hoyer, and Stock, 2007; Van Vaerenbergh et al., 2019).</p> <p>Current research suggests limited attention has been paid to emotional responses such as customer forgiveness as a positive response to service providers' recovery efforts (Suri, Huang, and Sénécal, 2019). However, this concept has recently been widely discussed in the marketing literature (e.g., Casidy and Shin, 2015; Harrison-Walker, 2019), further contributing to the importance of the current work.</p>	<p>outcomes during service mega-disruptions are needed.</p> <p><b>RO5:</b> Research is needed to reconceptualize customer responses in service mega-disruption contexts.</p> <p><b>RO6:</b> More research is needed to determine the limits of customer forgiveness for service providers following a service mega-disruption.</p>	<p><i>Proposition 3: Service mega-disruptions can elicit feelings of sympathy, especially when paired with perceptions of low controllability.</i></p> <p><i>Proposition 4: When facing changes in market conditions during a service mega-disruption, customers might experience more emotional forgiveness.</i></p> <p><i>Proposition 5a: Emotional forgiveness towards service mega-disruptions is likely to be negatively related to intentions to engage in negative WOM.</i></p> <p><i>Proposition 5b: It is possible emotional forgiveness towards service mega-disruptions is negatively related to complaint intentions.</i></p> <p><i>Proposition 5c: Emotional forgiveness towards service mega-disruptions is likely positively related to re-patronage intentions.</i></p> <p><i>Proposition 5d: Emotional forgiveness towards service mega-disruptions may be negatively related to switching intentions.</i></p> <p><i>Proposition 6: Service mega-disruptions may fail to elicit feelings of empathy as perceived similarity with a service provider potentially decreases with (a) increasing temporal duration, (b) increasing spatial distance from onset of the</i></p>
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			<p><i>disruption, (c) increasing social distance, and/or (d) increasing probabilistic occurrence of the event.</i></p> <p><i>Proposition 7: Service mega-disruptions fail to elicit feelings of sympathy as perceived controllability increases with (a) increased time from onset of disruption, (b) expanding scale, size and volume of impact within a given industry, and (c) expanding scope of disruption impact into wider and broader set of increasingly less related operations, services and industries.</i></p>
Service ecosystem	<p>Service ecosystems have recently been examined from a disaster/crisis perspective (Finsterwalder and Kuppelwieser, 2020) illustrating the importance of how systems self-adjust and develop to manage the circumstances and continue to create value (Vargo and Lusch, 2016).</p>	<p><b>RO7:</b> Investigations that measure the scope of customer emotions and perceptions for a service provider are needed in the wake of changing marketplace conditions from a service mega-disruption.</p> <p><b>RO8:</b> Research is needed to better understand the effects of changes in market structure caused by service-mega disruption on service providers.</p> <p><b>RO9:</b> Research is needed to determine which types of service mega-disruptions have the greatest impact on a service providers' control, agency, and ability to adjust to changing marketplace conditions.</p>	<p><i>Proposition 8: Service provider responsiveness, agency, and ability to respond is weakened during service mega-disruptions.</i></p> <p><i>Proposition 9: Loose-coupling in service ecosystems becomes tight-coupling in the immediate aftermath of a service mega-disruption. The longer the duration and scale of a service mega-disruption, the more difficult it becomes for interactions in the service ecosystem to return to status or return to looser coupling.</i></p>

	<p>Current work suggests there remains a pressing need for further conceptual development of service design in the context of complex service systems (Patricio, Gustafsson, and Fisk, 2018), such as the current work on mega-disruptions, with importance placed on the “resilience” of service ecosystems under crisis (Leite and Hodgkinson, 2023).</p>	<p><b>RO10:</b> The impact of service mega-disruptions on interactions between service providers, suppliers, wholesalers, and customers remains understudied and warrants research.</p> <p><b>RO11:</b> Research is needed on the duration and longevity of effects on service providers’ control, agency and ability to adjust following a service mega-disruption.</p> <p><b>RO12:</b> Measures of relational norm flexibility will be needed to determine how quickly service ecosystems adjust following a service mega-disruption.</p> <p><b>RO13:</b> Measures of mutual understanding of institutional arrangements will be imperative in research to determine integration of responses and ability to adjust to service mega-disruptions.</p> <p><b>RO14:</b> Research will be needed to understand perceptions of key resources following service mega-disruption within a service ecosystem.</p>	<p><i>Proposition 10: Service ecosystems adaptability is weakened overall following a service mega-disruption.</i></p> <p><i>Proposition 11: Shared understanding of institutional arrangements in a service ecosystem will be weakened following a mega-disruption. As the duration, scope, and longevity of the service mega-disruption increases, the mutual trust in the service ecosystem decreases.</i></p> <p><i>Proposition 12: Following a service mega-disruption, increased competition for key resources (base materials, infrastructure) will erode mutual trust. This effect will be magnified as duration of the mega-disruption continues.</i></p>
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**Figure 1.** Model of Service Mega-Disruptions

Source: Authors own work