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# Addressing Service Failure and Recovery in Digital Service Systems: Opportunities and Challenges

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**Abstract:** Digital service systems are changing the world as we know it, enabling companies to embrace new forms of relationship with their customers. The aim of this article is to propose a categorization of service failures in digital service systems and an illustration of recovery solutions based on life situations. Thus, this article used an exploratory case study research conducted in a Portuguese private bank. Data collection involved multiple sources, such as semi-structured interviews, customer complaints from an online database, and direct observation. The case revealed that digital service systems are not failure proof and service failures are inevitable. As a result, companies are struggling to consistently maintain high service standards across all channels and, for that purpose, have essentially invested on automated interactions. On the other hand, humanized recovery solutions are expected to enable organizations to make significant progress, including prevention and corrective actions, that will mitigate the perception of poor service delivery. While current studies tend to focus on what is going wrong in digital engagement, researchers have hitherto not investigated sufficiently this digital breakdown and the subsequent recovery solutions.

**Keywords:** Digital service systems, service failure, recovery solutions, channels, case study.

## I. INTRODUCTION

The service sector has witnessed major digital developments, due to the increasing adoption of automated forms of interactivity in service delivery (Ostrom *et al.*, 2015). Several examples endure in today's market that show the increasing use of automated service interactions. This tendency has been particularly impressive in banking services that are acknowledged as pioneers in the adoption of online technologies, and have paved the way for the multi- and omni-channel service experiences that are common today. In this vein, a case from a Portuguese private bank offered a relevant case study to analyse the digitalization of a great extent of service processes, and for enabling new forms of interaction with customers. Currently, a great extent of the customers' engagement with the bank frontline services, including account opening, mainly occurs via automated interactions. Although McKinsey has forecasted that by 2020 machines will manage 85% of all transactions, at the end of the day, digital, cannot stand alone – it is seamless integration with other channels that wins the

day (Baumgartner, Hatami and Uster, 2016). As real-time interactions with service providers and seamless interactions across multiple channels are a norm rather than the exception, companies are struggling to consistently maintain high service standards through all channels. At the same time, digital service systems are not failure proof, thus service failures have always been inevitable (Hart, Heskett and Sasser, 1990).

Service failure and recovery has been considerably studied in the last two decades (Reis, Amorim and Melão, 2019a). But, despite the insights reached, we still have a limited understanding concerning service failure and recovery on digital service systems. Failure and recovery is expected to enable organizations to make significant progress, including prevention and corrective actions that will mitigate the perception of poor service delivery. In light with the above, we propose a categorization of service failures in digital service systems and an illustration of recovery solutions based on real-life situations. While previous studies are focusing of what is going wrong through digital engagement (Azemi *et al.*, 2019; Rai and Appiah, 2019), researchers have, hitherto, not investigated sufficiently digital services systems breakdowns and the subsequent recovery solutions.

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In the next sections, we provide a review of digital services, service failure and recovery concepts. We then explain the methodological process and the analysis of the case results. We end up with a general discussion and brief conclusions.

## II. THEORETICAL BACKGROUND

Although service failure and recovery has been extensively studied in the last decades (Sparks and McColl-Kennedy, 2001), there is a limited understanding due the rising of new digital technologies that are virtually transforming everyday business operations in all industry domains (Fitzgerald *et al.*, 2013; Ross *et al.*, 2016). The aforementioned phenomenon is also known as Digital Transformation (DT), and, according to Reis, Amorim, Melão and Matos (2018a, p. 417-18), it has three distinct elements: 1) technological – where DT is based on the use of new digital technologies; 2) organizational – since DT requires a change in organizational processes or the creation of new business models; and 3) social – as DT is a phenomenon that is influencing all aspects of human life. The digital transformation changes *service systems* even further, becoming more and more automated, interactive, open, and learning systems (Böhmman, Leimeister and Möslin, 2018). These service systems are engaging virtual channels (Cortiñas *et al.*, 2010), emphasizing automation (Wirtz *et al.*, 2018) and being integrated in ecosystems (Vargo and Lusch, 2011). All in all, service systems co-create value for all stakeholders in the business ecosystem (Kwan and Min, 2008; Hänninen, Mitronen and Kwan, 2019). The rise of global service-based business models has transformed the way the world works (Maglio, Kwan and Spohrer, 2015); for instance, product-service systems (PSSs)'s popularity has expanded throughout recent years (Haber and Fargnoli, 2019). Fundamental change of a service economy is shifting the research focus from the digitalization of systems to digital service systems (Gou, Li and Dai, 2008a). William *et al.* (2010) define digital services as services that are arranged through a digital transaction over the Internet, while Wulf, Mettler and Brenner (2017) note that digital services are systems in which human participants and machines carry out activities using information, technology and other resources. Furthermore, Gou *et al.* (2008a) refers to digital service systems as a trend and a part of the digital society, which invoke digital information, computing, communication and automated technology-based systems that (co)-create the desired outcome (Pakkala and Spohrer, 2019). As the global economy

and business are in permanent change, it is likely that applications are integrated within and between organizations, and therefore it is expected that the architecture of services and applications can be combined into an integrated system – digital service systems (Gou, Li, Li and Zhao, 2008b). Nowadays, cities have been evolving as socio-technical and digital service systems, in which people are active actors are the core of all city constituents, where typically care whether their socio-psychological aspects and functional needs are met in a satisfactory manner (Qiu *et al.*, 2017).

Digital societies are supposed to be more efficient when delivering services through multiple digital channels, expecting minor errors or zero defects. However, while companies are struggling to consistently maintain high service standards through all channels, service delivery systems are not fail proof and, thus, it is unlikely that companies are able to avoid failures (Hart *et al.*, 1990; Komunda and Osarenkhoe, 2012). In this context, service failure is defined as any service-related mishaps, real or perceived, that occur during the online/offline service experience with a company (Maxham, 2001). Nowadays, complain management is an essential tool for managers, as service failures are inevitable and recovery encounters encompasses significant challenges (Reis, Amorim and Melão, 2019b).

In the last decades' researchers have proposed several service recovery options (Hazée, Van Vaerenbergh and Armirotto, 2017), such as apologizing, offering compensation and showing empathy or being courteous and respectful (Goodwin and Ross, 1990; Patterson, Cowley and Prasongsukarn, 2006). More collaborative insights propose co-creating service recovery with customers, which refers to the ability to find joint solutions between customer and the service provider (Roggeveen, Tsiros and Grewal, 2012). In general terms, service recovery refers to attempts that companies handle to rectify a service delivery failure (Kelley and Davis, 1994). It seems self-evident that poor service recoveries may cause a negative perception on customers (Maxham, 2001), in contrast to proper recoveries that can restore levels of satisfaction (Goodwin and Ross, 1992) or even it is conceivable that post-failure satisfaction exceeds pre-failure satisfaction in some contexts (McCollough and Bharadwaj, 1992). Present research is increasingly focusing on digital service systems breakdowns and subsequent recovery solutions, rather than focusing only on traditional service delivery.

Current trends in technology is allowing industries to build services based on artificial intelligence technologies or robotics automating business processes, therefore enhancing service delivery (Sousa, 2015). However, despite the progress in artificial intelligence (AI), few organizations have incorporated successfully AI-related technologies in their service delivery systems. Service robots (e.g. virtual assistants) and automation have evolved from one-function automation to intelligent systems with versatile features, which share the same space and tasks with humans (Savela, Turja and Oksanen., 2017). However, as Wirtz *et al.* (2018) argues, it seems unlikely that robots will possess the social intelligence and communications skills to deal with complex emotional issues. Therefore, in contexts of higher customer contact, frontline employees can perform complex social/emotional tasks, while service robots are likely to be more successful in activities where greater cognitive/analytic skills are required. In light with the above, it is likely that for simple service failures, bank virtual assistances or automated processes will be enough for troubleshooting. Nevertheless, for failures where a complex social/emotional relationship is needed, frontline employees will be essential to the service recovery process.

### III. METHODOLOGY

This article uses a qualitative case study research. The authors collected data from a Portuguese private bank, since the banking sector has a long history in adopting new channels in service delivery (Sousa and Amorim, 2009). The data collection centred on customer complaints and involved multiple sources, such as an online database, semi-structured interviews from frontline employees, and direct observations.

The online database, where customer complaints were collected, is known as *Complaint Portal*, which is operating since June 2009 and currently receives millions of Portuguese every month. According to the official website, 98% of the visitors' search the website to communicate with other consumers, brands and public entities, as well as to compare brand ranking based on consumer satisfaction index, which reveals that the platform is more than a place to complain, being also a barometer of brands reputation (PQ, 2019). The Complaint Portal is not a mediator between parties (i.e. customer/user and company) and does not have any arbitrary role. Once a user registers a complaint on the website, the Complaint Portal

validates the claim and adds it online. Then, the company is notified by electronic mail and it is asked to respond to the claim. Whenever there is a response from the company, the user is notified by electronic mail. Therefore, the Complaint Portal operates as a platform for publishing claims by registered users and facilitates the communication with companies. From January 2011, the unit of analysis (bank) received 445 complaints (PQ, 2019). When compared with similar brands, the bank achieved a satisfaction index of 75.5%. In the last 12 months, the bank exchanged 370 emails with the users of the Complaint Portal, thus, resulting in 83 solved situations. In other words, the service recovery rate is 41.3% (successful recovery) (PQ, 2019). We analysed 111 complaints from the last 6 months – from January 1<sup>st</sup> to July 1<sup>st</sup> of 2019 – with the purpose to categorize the service failures in the past semester.

The interviews as a source of data collection is widely used in case studies and is described as "dynamic meaning-making occasions that result in a collaborative production of knowledge" (Mills, Durepos and Wiebe, 2010, p. 495). We decided to use semi-structured interviews as a qualitative data collection strategy. This choice is justified by the intention to conduct a series of predetermined but open-ended questions, with the purpose of having control over the topics, but with no fixed range of responses to each question of the protocol (Given, 2008). We have obtained informed consent in accordance with the procedures of the study protocol (Mack *et al.*, 2005). However, we know that access to sensitive data can cause harm to individuals (National Research Council, 2000), and for that reason, we do not provide any information about key respondents and the respective organization. The research protocol was used to increase reliability of the case study research and it had the purpose of guiding the researchers to carry out data collection (Yin, 2014). We interviewed 11 highly experienced informants from the frontline services of the bank, who were directly involved in the service recovery process. We had access to the bank through an official request, subsequently the respondents were asked to facilitate new interviews, from what is known as snowball sampling (Merriam and Tisdell, 2015), a sampling strategy that fits well the banking industry research (Reis, Amorim and Melão, 2018b). The interviews were very relevant to illustrate possible recovery solutions to the service failures posted on the platform.

We started collecting data through observation by making informal visits to the bank, to become familiar with the context, the people, and the activities. These informal visits were followed by intense and targeted observations of the phenomenon of interest (Merriam and Tisdell, 2015). Thus, the participants were systematically observed to enable documentation of the real life phenomenon and serendipitous moments. We have structured our observations by creating a checklist based on the following items (5Ws) – Who? What? When? Where? What for? – to register all the events. The field notes were recorded in a research diary (Fisher *et al.*, 2007), that had notes from informal conversations, observation of meetings, and processes (Voss *et al.*, 2002). This information was used, e.g., as generator of questions to be used in an interview (Thorpe and Holt, 2008). Direct observations were typically the secondary source of data collection and they were useful for corroboration and clarification purposes.

We analysed the data through *content analysis*, which is a well-known “research technique for making replicable and valid inferences from texts (or other meaningful matter) to the context of their use” (Krippendorff, 20018, p.18). Using a computer-assisted qualitative data analysis software NVivo - QSR International, we have analysed the data by clustering the text into hierarchized categories and subcategories (Reis *et al.*, 2019b), so as to identify emerging patterns and ideas (Skälén, 2011).

#### IV. FINDINGS

This section investigates how the selected unit of analysis is employing its channels to support customer complaints. To the best of our knowledge, this is one of the fewest attempts to offer new insights in the field of digital service systems.

##### A. Opportunities

###### *Reducing the Service Failure Recurrence*

The situation that showed a lower recovery satisfaction was identified as *sequential service failures*. In other words, we have identified customers that had a service failure, which was solved in a first moment, i.e. moment of true (Grönroos, 1988); however, the same typology of failure, occurred again after a short period of time. Which is the same to say, the bank only solved this failure in a temporarily manner, rather than having changed the process. We

verified that it was not enough to apologize, listen the customer, or showing empathy (Shapiro and Nieman-Gonder, 2006), but rather, the bank should search for an effective process change.

If the bank takes the opportunity to improve their processes, it can definitely increase the customers' recovery satisfaction. For instance, if an automatic failure (e.g., unduly charged fee) is quickly recovered, it probably will not have a greater impact on the customer loyalty – *standard recovery*. Therefore, the recovery satisfaction is due to the bank rapid response, apologizing and service normalization. On the other end, we observed the customer negative feedback was clearly related with service failure recurrence and the discomfort caused by the loss of multichannel freedom. Thus, service normalization is not enough, if the process remains unchanged. This means, the customers were very displeased, not for the failure itself, but for the recurrence of the service failure.

Regarding the aforementioned situation, the digital service systems were not enough to enable the customers' recovery satisfaction; thus, the customers ended up seeking help from frontline employees, in an attempt to re-establish the service delivery – *personalized recovery*. This last note is in line with Wirtz *et al.* (2018), in the extent that frontline employees are more competent when dealing with complex social/emotional tasks. Indeed, the human factor is known to provide an adequate explanation of the service failure/recovery; but also in aiding the service process changes since these employees are best qualified to provide accurate information about the customers' preferences and expectations.

##### *Relationship within the Business Network*

Another opportunity that was identified during the complaint analysis is the relationship between entities within the same business network. Business networks are companies within the same group of the bank e.g., “Ocidental” – insurance company. In that regard, a real example is provided, as a customer who acquired an Ocidental insurance within the banking infrastructures and, therefore, when something went wrong, it was the bank that received the claim. Solving service failures within the business network turns the process slow, deteriorating the relationship between customers and organizations. In our view, a digital service system is lacking, to mediate these situations, where organizations can collaborate in a faster way, using digital services as an opportunity.

## B. Challenges

### *Restoring the Multichannel Freedom*

The origin of multichannel freedom loss is mainly due the lack of *circulating information*; in this regard, the question which is often addressed to the bank is: "when I cross with a service failure, to what channel should I address the issue?".

Direct observations evidenced that the bank has invested on several automated applications that allow service failure recoveries, i.e. virtual tools, such as: e.g., *click to chat*, the customer interacts with the bank via Messenger; or *click to call*, the customer informs the bank through an online channel that wishes to establish a telephone call. However, we verified that often customers feel lost with so much available channels at their disposal, since they are not sure about the channels' attributes. In this regard, frontline employees have suggested additional technologies, such as chatbots or other digital mechanisms that could route customers to the adequate channel within the bank. Thus, digital service systems will probably be adequate to manage and recovery from service failures. This recommendation is in line with Manyika *et al.* (2017), which argue that automated or semi-automated services (e.g. service robots) are more competent performing complex cognitive and analytical tasks due to underlying computer power.

The analysis of customer complaints evidenced that, when the bank does not provide an adequate response through most convenient channels, some customers started looking for solutions through alternative channels outside of the bank's borders. Some alternatives are virtual channels, such as: the complaint portal, customer protection portals or even social networks. In other words, once the multichannel freedom is lost, the client has no longer confidence in a quick reply and looks for alternative channels that put pressure on the service recovery. Therefore, we are confident that customers value certain typologies of virtual channels, but when they do not find solutions in such typologies, they start looking for alternatives outside the bank. The challenge to re-establish the multichannel freedom is of particular interest to customers that are living abroad of Portugal, as they were more vulnerable and, being more dependent on digital service systems to get in touch with the bank, a positive/negative evaluation of the service recovery is likely to be exclusively dependent on a virtual recovery or we could say on the re-establishment of the multichannel freedom.

A third group of customers sought a solution for the service failure recovery within the frontline employees. This attitude most likely happens because the bank is not fully omni-channel. Hence, it is necessary to map the service failure and guide the customers during the recovery process. The frontline employees were once again essential in the recovery process, since they were better prepared to employ immediate corrective actions that mitigated the perception of poor service delivery. This advantage is probably associated to the social/emotional capability of humans when compared with the aforementioned chatbots.

### *Relationships Outside of the Company's Business Network*

From the data analysis, we identified complains that were not exclusively from the bank responsibility, as these complaints are either due to third parties' relations (e.g. Portuguese tax and customs authority) or regulatory entities (e.g. Bank of Portugal). The complains that involved external organizations were one of the most serious in terms of recovery and received the worst feedback from customers. In the previous section, some service failures were identified as *standard* (i.e., the moment of truth), and the recovery process has been relatively fast and consequently received a better customer feedback – *recovery by the firm* (Zhu *et al.*, 2013). In this case, customers were not willing to wait for the bank recovery, and digitally connected themselves with the involved external organizations, therefore seeking a recovery through the maximum available channels. The purpose of using digital systems was, on the one hand, to discover where the service failure occurred and to determine the institutional responsibilities, as well as to be part of the service recovery. Consequently, the customers ended up assuming the bank's responsibilities and intervene as a mediator between the bank and the third party in an attempt to regularize the situation – this is known as *recovery by the customer* (Zhu *et al.*, 2013). In these particular situations, and despite the customer efforts, we acknowledge the existing difficulty in establishing a virtual network with the third party. Therefore, service failures are actually being reclaimed between the trilogy "bank employees – customer – third party", this is also known as *joint recovery by the firm and the customer* (Zhu *et al.*, 2013). This situation usually results in a time-consuming recovery, and, therefore, developing a greater perceived loss.

## C. Contributions to Practice and Theory

One of the most relevant queries for practitioners is to find out what motivates customers to lose the

multichannel freedom, while they search for another channel to interact with the bank. The evidence has shown the lack of multichannel freedom is particularly associated to the bank's inability to reply the customer requests, or simply due to a poor service on the preferred customer channels. The aforementioned situations may illustrate the reasons why digital service systems are so relevant, as these systems offer further channel alternatives. However, too much digital services can also add more entropy into the system, if the channel buddle does not have the same recovery attributes; this situation might lead customer perceived lost or channel cannibalization (Huang *et al.*, 2016). In case of deficient recovery attributes, one could recommend alternative tools to guide customers through the service recovery process (e.g. chatbots) or, to follow an omni-channel strategy, where all the channels can provide a consistent recovery. The bank should also improve its relation within its business network, so that it can take advantage of the digital service systems, to enable faster service recoveries and improving the relationship with the bank stakeholders. To theory, we believe that our article makes it even more evident the opportunity that digital service systems represent, especially in digital transformation contexts.

## V. CONCLUSION

This research contributed to the service management literature in two ways. First, it provided exploratory evidence related to the classification of service failures (i.e. sequential service failures; failures within business networks; third party service failures) in digital service systems, with the aim of promoting the simplification of recovery procedures. Secondly, in our view, the main results were related to service recovery. In that regard, the results revealed that, in some occasions, frontline employees are better prepared to recovery from service failures, when compared with automated or semi-automated services. Frontlines employees are better prepared to employ immediate corrective actions that mitigate the perception of poor service delivery. This advantage is probably associated with the social/emotional capabilities that frontline employees have when compared to machines. For another side, additional technologies, such as chatbots or other digital mechanism can also route customers to use adequate channels within the bank, while these technologies perform better cognitive and analytical tasks than humans, guiding customers in the quest for the service recovery. This last situation was identified

to best suit customers that are dependent on digital service systems, such as emigrants.

This article is not free of limitations, as the data collection was confined to a single Portuguese private bank, and, therefore, this particular study does not have generalization purposes. Due to privacy reasons, it was impossible to map within the bank all the complaints that were posted on the platform; for this reason, the experience of the frontline employees in assisting the researchers evaluating possible recovery solutions was of paramount importance.

We interviewed frontline staff primarily because there were previous studies that showed that customers were turning to physical services when they did not have an answer to their complaints in the online recovery (Reis *et al.*, 2019a). Along these lines, we believe that it would be interesting for researchers to strengthen our results with feedback from online banking employees in order to understand to what extent these employees can streamline customer responses. Additionally, we suggest conducting a intra-sectorial study, that is, analysing all complaints from the first day the website – complaint portal is operating across all other national banks.

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