Opportunities and challenges raised by Customer-to-Customer Interaction to service operations management: a quality management perspective

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Opportunities and challenges raised by Customer-to-Customer Interaction to service operations management: a quality management perspective

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Abstract

It is widely recognized that the presence of other customers is an important social component of the servicescape with an impact on the quality of services provided and, in particularly, on customer experiences Therefore, increasing attention has been paid to customer-to-customer interaction (CCI) by management literature, both by marketing and by operations management scholars.

As stressed in previous literature, there are several types of CCI, each of them posing different opportunities and challenges to service providers. Digital transformation has also been contributing to the

emergence of new forms of CCI through online platforms and other social media channels.

The diversity of CCI forms has recently led to the development of CCI typologies (and taxonomies. Yet, the implications of CCI on the systems and tools typically used to manage quality in service operations, highly focused on the reduction of variability and unpredictability, are still under-researched.

Based on a review of the literature on CCI and on a critical analysis of some scenarios, this paper identifies the main strategies and tools that have been used to either foster value creation through CCI or to mitigate their negative consequences, giving a particular attention to transport services. From a services operations perspective, and more specifically from a quality management point of view, some recommendations are derived on how to better deal with this additional source of variability, inconsistency and complexity.

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1. Introduction

Service experiences build on multiple interactions among customers, service providers and the tangible and intangible elements of the service system. Service encounters involve periods of time during which a customer directly comes into contact with a service provider (Shostack, 1982), notably by accessing its facilities and other interface such as web of phone channels. Over the years, researchers have emphasized the importance of service encounters, service channels, interfaces and service touch points in service processes, as the key elements to support the customer-provider exchanges that are inherent to service delivery.

In the seminal work of Sampson and Frohele (2006) services are defined as productive activities that act on, and modify, customer provided inputs, such as the customer self, customer information or customer tangible possessions. The need to act on customer provided inputs has been the prevalent rationale used for explaining the need for customer presence in many service settings, as well as for the existence of exchanges and communication between customer and provider throughout service provision. This largely explains the micro-nature of service processes, and the need for providers to setup interfaces and channels to support the interactions and flows from and towards customers (Sousa et al. 2015). In this vein, over the years many researchers have subscribed to the view of a service process as a collaboration instance, i.e. a process that supports the integration of internal capabilities (i.e. from the provider) with external resources, and that involve an active participation of customers in the creation of outputs and value (Vargo, Maglio and Akaka, 2008).

This collaborative nature of the service production systems results into different types of interaction, including, the interaction between the customer and the front-line employees, the interaction between the customer and the service environment (also called servicescape or the

tangibles) and also potential interactions among customers (Wu, 2007; Wu, 2008), who coincidentally share the same service experience, for which they coincide in time or in space. It is thus widely recognized that the presence of other customers is an important social component of the servicescape with an impact on the quality of services provided and, in particularly, on customer experiences (Lin, Gursoy and Zhang, 2019; Nguyen, Ferraro and Sands, 2019).

Customer-to-customer interaction (CCI) has been increasingly regarded by both marketing and operations management scholars as a key element in shaping the service experience (Camelis et al., 2013) with a great impact on the performance (Frei, 2006) and on the quality of the service provided (Bendapudi and Leone, 2003, Kim and Choi, 2013). In some services, namely on the so-called CCI-driven services, as emphasized by Nicholls (2010), CCI is one of the main sources (if not the leading source) of value creation. That is typically the case of the leisure industry (including tourism), of sports events and, increasingly, of the education sector. In these cases, CCI is more and more being managed as an important source of value creation, with managers looking at issues such as customer compatibility and actively developing customers' socialization strategies (Reichenberger 2017). In other services CCI might be the core element of the service provision. In the early work of Baron et al. (2007) the authors explore the illustrative case of speed dating services where CCI, referred by the authors as a "conversational dyad between customers" is the reason driving the consumption decision.

In recent years, digital transformation is offering new and more advanced opportunities for CCI, and therefore explain the importance given by service providers to the matter. Social media, for instance, have empowered customers to band together and exchange information. Recently, customers have started to be considered as belonging to a community (Carù and Cova, 2015), with attention being given to the

collective dimension of experiences. Multi-player gaming and peer-to-peer IT support are examples of collective consumption contexts. Another interesting phenomenon is the emergence of virtual brand communities where customers interact with other customers providing feedback in a dynamic process (Brodie et al., 2013).

These differences in the role and importance played by CCI have recently led to the development of CCI typologies (e.g. Moura e Sá & Amorim, 2017) and taxonomies (e.g. Lin et al., 2019). Yet, the implications of CCI on the systems and tools typically used to manage quality in service operations are still under-researched.

Within the contemporary literature on service marketing, dominated by the Service-Dominant Paradigm (Vargo and Lusch, 2008), the presence of customer is very much regarded as an opportunity to increase the resources available in the service delivery process, which can be integrated to generate additional value. On the other hand, for the service operations field, such presence, with different purposes and degrees of intensity, represents an additional factor of uncertainty and unpredictability, which can jeopardise obtaining consistent results. It should be stressed that consistency and reliability are among the most acknowledged dimensions valued by customers in what concerns service quality.

The purpose of this paper is thus to explore the implications of CCI for customer introduced variability in service systems, offering as first building block to identify the strategies and tools that can be implemented to either foster value creation through CCI or to mitigate their negative consequences. With this purpose in mind, a literature review and an analysis of some real case examples are conducted. To a certain extent the current research builds on the paper "A Typology of Customer-to-Customer Interaction and Its Implications for Excellence in Service Provision" (Moura e Sá & Amorim, 2017), where, as the title suggests, the authors have proposed an innovative typology capable of

guiding the identification of potential operations management strategies used to deal with CCI in the service environment context. The typology is based on two-axes: 'service delivery orientation' (i.e. the degree to which the organisation, its processes and operations are focused on the promotion of CCI) and 'exchange orientation' (i.e. the degree to which rich and highly customised CCI are expected).

By addressing this under-researched issue, this paper contributes to the services management literature, notably for the domains of service operations management, services marketing and quality management. From a services operations perspective, and more specifically from a quality management point of view, some recommendations are derived on how to better deal with this additional source of variability, inconsistency and complexity.

The remainder of the paper is structured as follows. In the next section, the conmceptual background of CCI is presented, looking at its different forms and consequences. The implications of CCI to service quality are particularly stressed, by analyzing its impacts on relaibaility and consistency. Section 3 is dedicated to the exploitation of the proposed CCI typology in terms of the value creation opportunities offered in each scenario and potential strategies to address them. In this regard, a special attention is given to the transport sector and to technological solutions that are emerging in this context. The following section, looks at the role of quality management in mitigating the effects of negative CCI and enhancing its positive effects and makes some recommendations on the matter. Finally, the paper concludes with some remarks that are expected to foster future research on the topic.

2. Conceptual background: CCI, service quality and customer introduced variability

2.1. Customer-to-customer interaction: forms and consequences

The literature that analyses the impact of CCI on customer satisfaction is relatively vast, even if most of the studies concentrate on a limited number of contacts in specific service business sectors, including restaurants, tourism and transports.

One of the first conceptual models developed to analyse the effect of the presence of other customers at any stage of the service delivery process on the way the customer perceives his/her own experience was suggested by Langeard et al. (1981) and became known as the 'Servuction Model'. More recently, the Service-Dominant Logic (Vargo and Lusch, 2008) gives emphasis to the exchange and value creation process that occurs when customers interact with service providers. With the emergence of this Logic, service providers loose the central role they had in the value creation process and all the actors are regarded as resource integrators (Vargo and Lusch, 2008, p. 3). Along with this thinking, CCI has also an impact (either positive or negative) in the value creation process. In addition, the increasingly large literature on experiences – understood as the subjective customer response to the moment of contact with the service provider (Kim and Choi, 2013) – gives even more emphasis to CCI, given its great impact on the rational, emotional, sensorial, physical and spiritual involvement of the customer (Verhoef et al., 2009).

The literature typically makes a distinction between positive and negative CC interaction. Positive CCI is related to collaboration and

socialization, whereas negative CCI is in general the consequence of the behaviour/misconduct of problematic and disturbing customers (Kim and Choi, 2013, Kim and Choi, 2016).   Positive CCI makes the service experience more valuable and memorable having beneficial effects in what the identification of the customer with the brand and the degree of commitment with the service are concerned (Yoo, Arnold and Frankwick, 2012, Curth, Uhrich and Benkenstein, 2014), thus contributing to enhance satisfaction and loyalty. Furthermore, the presence of other customers, regarded as more experienced and skilled, may provide models of behaviour and contribute to reduce the levels of anxiety (Zhang, Beatty and Mothersbaugh., 2010). In line with this, recently, the role of customers in service delivery has been extended. As an example, the customer-citizenship concept has emerged, as embracing "voluntary and discretionary behaviours that are not required for the successful production and/or delivery of the service, but that, in the aggregate, help the service organization overall" (Groth, 2005, p. 11). Yi and Gong (2013) suggest that customer-citizenship behaviour comprises four dimensions: feedback, advocacy, helping and tolerance. On the other hand, negative CCI is associated with deviant behaviour. According to Fombelle et al. (2019), customer deviance can be defined as "any act by a customer in an online or offline environment that deprives the firm, its employees, or other customers of resources, safety, image, or an otherwise successful experience". Other customers can be the target of such deviant behaviours. Customers can engage in minor deviant behaviours towards other customs, such as cutting in line, or more aggravated deviant behaviours, such as verbal or physical abuse. In some cases, disturbing behaviours are directed towards frontline employees. As stressed by Kilian et al. (2018), such attitudes might have an impact on other customers who might feel embarrassed and uncomfortable and can lead to consumer dissatisfaction with the service encounter, negatively influence consumer loyalty, increase negative word-of-mouth, and

negatively influence the image of the service provider. Moreover, customer can also be affected indirectly by deviance towards the service facilities (Schaefers et al., 2016).

Other usual distinctions are made between on-site (face-to-face) CCI and off-site (remote) CCI (Nicholls, 2010) and between direct and indirect CCI (Martin and Pranter, 1989). In this latter case other customers are part of the 'scenario' but do not interfere in the customer experience. Similarly, Finsterwalder and Kuppelweiser (2011) propose an interesting distinction between accidental and intentional interaction.

Digitalisation has introduced new forms of CCI. Electronic word-of-mouth, for example, has spread across all service contexts and became a preferred method of information for many customers ((King, Racherla and Bush, 2014).

Research on CCI essentially follows two lines: one that seeks to identify and characterise the roles played by other customers who are present during any stage of the service delivery process (e.g. Yoo et al., 2012, Camelis et al., 2013) and another focused on the determinants of positive and negative CCI (e.g. Kim and Choi, 2013, Kim and Choi, 2016). Such determinants are mainly associated with the degree of customers' affinity (homogeneity) and with the physical conditions where the service delivery takes place (the servicescape).

On a recent study Heinonen, Jaakkola, and Neganova (2018) highlighted the need to advance the research that can facilitate the management of CCI, offering a framework to relate different types of CCI with value creation opportunities. The diversity of CCI forms requires service providers to take different actions, which, depending on the positive or negative effects of CCI, are capable of either promoting or preventing such interaction. The service concept thus needs to be designed to systematically and intentionally encourage positive interactions, while simultaneously avoiding negative tensions that might result from the presence of other customers.

2.2. Service quality: the importance of reducing variability and improving reliability

Service quality typically embraces a set of dimensions, which have been categorized under the Parasuraman, Zeithaml and Berry model (Parasuraman, Zeithaml and Berry, 1988) under the following labels: tangibles, reliability, responsiveness, empathy and assurance. Although potentially any of these dimensions might be influenced by CCI, reliability is particularly susceptible.

Consistency and reliability are among the most acknowledged dimensions valued by customers in what concerns service quality.

Reliability has been originally defined as "delivering what is promised" (Parasuraman et al., 1988). More recently, reliability is regarded as the ability to deliver the expected standard at all time, performing right services for the first time, providing services within promised time and maintaining error free record (Iberahim et al., 2016). Reliability is therefore associated with the idea of predictability, and the capability of service systems to meet customer expectations in an adequate manner (e.g. time of delivery, length of service episodes, etc.).

Consistency is an important aspect of reliability. Frei et al (1999) have emphasized the relevance of consistency to service quality. Consistency refers to uniformity, meaning that the quality is always the same. The service output should the uniform around an ideal target value determined by customers.

Most services have a high human participation component and that brings unpredictability to service operations. One of the main sources of variability comes from the customer-employee dynamics during service encounters (Yang, Cheng and Lin, 2015). According to Yang et al. (2015), variability potentially has an impact in all service-quality gaps identified by Parasuraman, Berry and Zeithaml. Variability in employee

capability, method and effort, for instance, is a major driver of the service delivery gap. Personality differences also shape attitudes variability. Similarly, especially when customers are active service co-producers, their differences in terms of knowledge and skills can also add to variability causes.

Authors such as Frei (2006) highlighted that mitigating and controlling service process variation can be more important than improving in aggregate process performance on the eyes of the customer. Frei (2006) characterized different types of customer introduced variability, providing a rationale about how that may affect service outputs and quality, including customer arrival variability and customer effort variability.

It becomes evident that the presence of other customers in the service setting make the challenge of achieving a high level of reliability even greater.

3. In search of strategies capable of enhancing value creation derived from CCI: exploiting a typology

In recent years, the emphasis has shifted to exploring approaches that allow for a better understanding about the antecedents and consequences of CCI. Whereas the purpose of earlier contributions on this field were focused on mitigating undesired effects that CCI might have for the quality of the service experience, there is an increasing number of authors that explore how to leverage the potential value creation that can result from customers sharing time, space, information etc. In other words, CCI is increasingly addressed as an opportunity (as well as a challenge) for managers to explore how customer interactions can be included in the own specification of the service experience.

The potential to manage CCI for service value has been substantially amplified by technology, notably by the increasing connectedness

between customers and service systems. The generalized involvement of customers in wikis, social media, and similar network and interaction platforms, for example, allows for an unprecedented volume of information sharing across customers, enabling socialization and immense learning possibilities about services from the actions and expressions of peer customers (Zadeh, Zolfagharian and Hofacker, 2019). Technology also has amplified the impacts and benefits that can be built on CCI, i.e. increasingly, the focus is changing from a dyadic perspective, where the focus was on one to one CCI, to explore the CCI in contexts of large groups interaction, such as in online social media environments where new forms of group conversations, and threads, allow for a large number of participants to observe the behavior of many.

Some literature (e.g. Rowley, 1996) suggests that the longer the time the customer remains in the service environment, the greater the responsibility of the service provider to manage the interaction that is likely to occur among customers. Yet, time is not the solely (and sometimes not even the most important) factor ro be taken into consideration

In order to devise strategies capable of increasing value creation through CCI it is important to build on knowledge about the different forms and contexts where CCI takes place. Several authors have therefore advanced with reviews on CCI manifestations as well as with criteria to identify and distinguish different types of CCI, which would justify the development of specific managerial approaches. This line of work builds on the observation that the types of interactions between customers varies across different types of services (Amorim, Moscoso and Lago, 2015). In this vein several authors have characterized different roles that customers can assume when interaction or providing assistance to their peers, distinguishing, for example helpseekers, proactive helpers and reactive helpers (Yoo et al., 2012). Likewise, Zhang, Beatty, and Mothersbaugh (2010) advanced the roles of help

seeker, reactive helper, proactive helper and complainer. Camelis et al. (2013) propose the distinction between customer who give information about the service to others, from those who establish social behavioral rules, to a set standard for comparison, or else to make other customers experience more enjoyable, to disturb and to encourage other customers' participation. Moura e Sá and Amorim (2017) advanced a typology to classify different forms of CCI as a first building block to support managers in the development of strategies to make the most out of the opportunities offered by CCI. Typologies are built around a set of characteristics that enable a classification logic that distinguishes across types of CCI, supporting the the specification for differentiated strategies. The proposed typology (Moura e Sá and Amorim, 2017) offers a framework for the differentiation of the type of CCI observed in a service according to two criteria: 'Service Delivery Orientation' and 'Exchange Orientation'. Service delivery orientation refers to the structural and infrastructural characteristics of a service system, notably to extent to which the service operations and processes are oriented towards the objectives of exploring CCI value. Such cases correspond to service settings where firms have adopted an intentional approach to integrate customer-to-customer experiences in the the service system and operations are designed to induce CCI. The criteria of "Exchange Orientation" refers to the nature and richness of interations between customers. The typology allows for the identification of four types of CCI service settings, as described in Table 1.

Types of CCI	Description	Examples and Implications
Casual CCI	The interactions between customers are a consequence from the structural characteristics of the service system. CCI is not actively pursued as an outcome, neither by service providers nor by customers.	Casual CCI is a common occurrence in services where customers are brought together due to the need to share a service system asset (e.g. infrastructure, equipment). Examples include transport services and heathcare services. Often the most visible face of CCI are inconveniences such as wait or crowding effects.
Staged CCI	In these service settings, CCI is an important, and expected element, of the whole service experience, although not being the main reason for the service consumption.	Staged CCI frequently takes place in restaurant, sports and casino services, where customers go with an individual purpose, but have explicit expectations about the characteristics of other customers that they anticipate to meet in the service encounter.
Functional CCI	In these service settings providers have realized the operational gains that can be built from CCI. In these cases, whereas CCI are not the core purpose of the service encounters, providers decide, for example, to engage customers in some tasks to improve the quality and productivity of the service experience.	In functional CCI providers involve customers in functions to support the operations and the performance of the system, for which customer participation is important. For example, providers resort to socialization practices, to foster the learning and acquaintance with the service system through the interaction and exchange of information between customers.
Deliberate CCI	In these circumstances the service providers set up the service setting with the specific purpose of facilitating and promoting CCI. Both the provider and customers are oriented to deliver CCI as a key element of the service experience.	In these settings customers hold specific requirements about the nature and content of the interaction they expect in the service, including the type of peers they aim to interact with. The service delivery system is therefore designed to accommodate the CCI requirements. In some settings providers act as facilitators of the match between customers. Examples include matchmaking platforms (e.g. crowd sourcing for investment, innovation ideas, etc.), exhibitions and sectoral fairs, etc.

Table 1. Identification of different CCI scenarios and their implications

The rapid expansion of digital technology, notably the increased availability of locational data and smartphone applications, is a cross cutting phenomena that is resulting into a level of connectedness among customers that creates opportunities to improve the management of CCI. Many of the shortcomings or inconveniences of CCI across the different types of CCI identified in Table 1 can be overcomed or minimized if service providers resort to such technologies, to improve the management of CCI. Examples of such possibilities include the use of digital technologies to deliver customer information about other customers, or their levels of use or load in the service system, and in this way allow them to adjust their consumption decisions and increase value. In this paper we have chosen the example of transport services to provide an illustration of the potential of technology to address CCI from a managerial perspective.

Transport services are a particularly interesting arena of service management and research. In recent years the levels of mobility have increased substantially across territories, and this has increased the concerns about topics such as congestion, and the consequent implications for the quality of such services. When customers choose their transportation modes for a given journey they take into account the relative benefits that different transport modes offer (cost, lenght of the journey, environmental impact are likely evaluation criteria). Whereas variables such as the cost, convenience (e.g. speed) of the transport play a key role on the decision, customers are also very sensitive to variables related to the quality of the service provided. In this regard, congestion, and elements related to potential inconveniences associated with negative CCI in transportation facilities play a central role (DellOlio, Ibeas and Cecin, 2011). In order to attract customers and gain their loyalty, transport providers need to address any inconveniences and adjust the service to consumers' preferences. In Table 2 we present illustrative examples of technologies that are emerging in transport services that

build on the interaction between users to improve the quality of the service experience, while mitigating potential negative consequences of CCI. Each of the illustrative examples falls into one of the CCI type previously identified and its potential to assist the management of CCI is described.

Types of CCI	Examples of Technologies	Management of CCI
Causal CCI	*Waze* is a crowd-sensing service application that builds on Participatory Sensing Systems (PSS) technology. The users receive (almost) real time information about traffic that results from the inputs that are obtained (remotely) from the network of users.	• Information sharing about user utilization of the service systems allows for adjustment in customer decision and service use.
Staged CCI	*Meet and Seat* is a service offering from KLM that allows passengers to choose their seat on a flight, while linking their social media account (e.g. Facebook or LinkedIn) to the seat assignment. In this way customers can choose the seat according to their interests and of those expressed in the profile of other people on the plane.	• Adding service offerings can create the opportunity for some customers to derive value form CCI.
Functional CCI	*Digital Genius* is an airline artificial intelligence based service that builds on requests, complaints, etc. expressed by customers in social media to build a learning base for repetitive or frequent questions, allowing for faster and automated responses to customer queries.	• Building on the experience from the "crowd" of customers to develop knowledge for improved service response (and quality).
Deliberate CCI	*Lyft* is one of the largest ridesharing app that allows customers to pool transportation services on need. On-demand ride sharing holds many different designations including Transportation Network Companies, on-demand ride sourcing, ride-hauling, ride-booking, ride-matching, and app based ride sharing. Services such as Lyft and Uber serve as matchmakers: matching drivers to riders and vice versa.	• Allowing customers to interact and exchange services directly allows for value creation from customer asset use, and improved service flexibility and access.

Table 2. Examples of technologies and their potential to improve CCI management

It follows a more detailed description of the potential of technologies to enhance value creation within each of the identified CCI types.

- *Casual CCI – Using Collaborative Technologies to Share Information and Improve the Use of Transport Systems*

In transports service systems, such as road networks, customers share a (limited) asset/capacity. As such, some of the implications associated with CCI in these settings are predominantly negative, such as crowding and congestion effects.

In order to mitigate congestion effects the implementation of collaborative community-based navigation applications allows for information sharing about the use of the service system, and enables better decision making for customers regarding the use of the service (e.g. the road). The information shared in service such as WAZE enables customers to adjust their journeys (e.g. choosing alternative routes, or adjusting the moment of use of the service), and in this way contribute to diminish the inconvenience of crowding.

- *Staged CCI – Adding Service Functions to Allow for Value Creation trough CCI*

When customers use shared or public transport services, like flights, metro, trains, etc., they necessarily share the providers' facilities/equipment, for a certain amount of time. Very often, the customers are put together in limited spaces, occupying a seat very close to other users. For many this can result into severe inconveniences. The development of services such as Meet and Seat while not changing the structural characteristics of the service system, introduces the possibility of creating value from such customer proximity by adding a new service layer to the original transport purpose, through

allowing customers to pick a set next to another user whose company they might find enjoyable.

- *Functional CCI – Generating Knowledge by Aggregating Customer Experiences and Using Artificial Intelligence to Deliver Improved Service to Each Customer*

The feedback provided by customers from their services experiences, including customer complaints, requests for support, comments, among others, are a rich source of data for managers to learn about the quality and failures of the service and develop adequate answers. With the development of social media many of such customer expressions have become publicly available. However, the volume of customer generated content available is so enormous that it requires an increasingly large effort (e.g. time) for other customers to make sense of it and use it. As such, some companies have started to resort to the application of artificial intelligence capabilities to make sense in a timely manner of such a rich source of data. The services provided by Digital Genius allow for companies to be able to use the information derived from accumulated user experiences and feedback to build a body of knowledge to serve other customers, who might have similar request, and to provide them with faster and automated responses.

- *Deliberate CCI - Setting up Platform Service to Allow for Match Making between Customer Demands and (Capacity) Offers*

Ridehailing is one of the most rapidly growing forms of shared-transport services (e.g. companies like Uber, Lyft, etc.). Such on-demand ride services, build on a network of users that are willing to use their capacity as providers in the system. In this case the service provider's role is to develop and facilitate the use of platform systems that offer several service functions, including matchmaking between users, and transversal business functions such as payments, trust and

legitimacy models, etc. As such, the facilitation of CCI in itself might offer a (service) business opportunity on its own.

4. Implications and recommendations for quality management

Quality management cannot ignore the importance of addressing CCI, since, as it happens with many other service failures, customers tend to blame the firm/the service provider for the unsuccessful experience that results from deviant behaviours of fellow customers (Fombelle et al., 2019). As stressed before, CCI represents an additional source of variability, inconsistency and complexity that affects service performance. Contemporary quality management approaches can no longer accept the idea that customer-to-customer interactions are beyond the control of service providers. On the contrary, they have to give the issue a central role, contributing to the successful implementation of strategies aimed at enhancing the value creation that might result from CCI (see previous section).

In this section, we discuss some practices that can be used to prevent negative CCI (or mitigate their effects), while encouraging positive CCI. Most of these practices are linked with the quality management principles of customer focus, people involvement and continuous improvement and are expected to positively contribute to service excellence. Clearly, the investment in any of these approaches depends on the providers' perception of the effects of CCI and on their risk tolerance. Some approaches can benefit from technological devices, such as surveillance alarms and closed-circuit television, which allow for the early detection of conflict situations and other deviant behaviours.

A) Designing the most appropriate service setting

The design of the serviscape contributes to socialisation among customers, queuing design being one of the most popular examples (Carù and Cova, 2015). With a broader view, DeCelles et al. (2019) call attention to the existence of various 'environmental stressors' (both situational and psychological), including long lines, delays, noise, which, particularly in the flights contexts, have proven to have influence over customers' behaviour.

In accordance with the servicescape model (Bitner, 1992), ambient conditions, space and function, signs, symbols, and artifacts all impact how customers behave.   The impact of service designs that lead to crowding effects has attracted significant scholars' attention (e.g. Tombs and McColl-Kennedy, 2010). Music and scents have also been shown to influence interactions (Carù and Cova, 2015).

Therefore, when designing the service seting, quality management needs to consider such elements, finding an adequate balance among efficiency, comfort and adaptability.

B) Empowering frontline employees to act quickly

Social approaches to deal with CCI require an investment in staff competencies. Previous research (e.g. DeCelles et al., 2019) argues that employees' attitudes of helpfulness and empathy have a strong impact on diminishing the negative effects of situational stressor. As the authors highlight, "to experience empathy and to be helpful towards individuals who are suffering requires [service employees] being aware of their needs and feeling capable of helping" (DeCelles et al., 2018, p. 53).

Some studies have revealed that employees eye contact with customers, by showing attention and recognition, have an impact on discouraging stealing (Fombelle et al., 2019) and the same probably applies to preventing negative CCI.

From a quality management point of view, it is possible to work on job descriptions to foster employees' proactivity in identifying and preventing

situations that can easily lead to tensions and conflicts among customers. Making this priority explicit in procedures and job descriptions can reduce too much variation and discretion in the way employees act when facing such situations, thus contributing to service consientncy and reliability.

C) Better planning customer participation

The concept of customers as service co-producers is well-established in service literature (Carù and Cova, 2015). Given this active role, some studies have emphasised the importance of planning and managing their participation in order to achieve the desired outcomes in terms of (high quality) service experiences. We believe that this idea can be expanded to embrace CCI issues. Emphasising social norms of adequate conduct can be one of the most valuable strategies in this regard, In fact, managing social norms might be an important strategy to prevent customers from engaging in negative CCI (Fombelle et al,, 2019). In this regard, injunctive normative messages (e.g., "leaving garbage in the coach is strongly disapproved") might be effective, together with other messages that cultivate guilt for those who violate social norms (e.g. "patients' rest can be disturbed by your noise"). In any case, this is just an example of the mechanisms that service providers can implement to improve customers' knowledge and skills to deal with other customers that might be present at the servicescape (either face-to-face or remotely). If the atrategy results, not only customers' perceptions of service experiences will improve, but also the pool of resources available to produce customer value will be enhanced.

5. Concluding remarks

The current paper has extensively reviewed the different forms of customer-to-customer interaction, calling attention to their effects (either

positive or negative) on customer experiences and satisfaction. Iy became evident that CCI is an element of the servicescape that needs to be adequately managed if service excellence is to be pursued.

It was also stressed that, although potentially occurring in any service environment, the role of CCI is different depending on the nature of the service at stake and on the value proposition developed by the service provider. Building on a CCI typology that classifies the service scenarios into four categories – casual CCI, staged CCI, functional CCI and deliberate CCI – different examples were given on how to take advantage of positive CCI. The role of technology in this regard was clearly emphasized. With special reference to transport services, severaltechnological solutions were described, which illustrate how value can be created in each CCI category by both motigating the negative effects that may rise by the presence of other customers and by reinforcing the positive consequences that are likely to be associated with pleasant and enriching interactions.

The analysis of the various types of CCI, their causes and consequences in different service settings, has led us to the identification of different operational strategies that need to be in place to ensure in particular that two important dimensions of service quality are attained – consistency and reliability. Most of such strategies relate to quality management principles of customer focus, people involvement and continuous improvement and require organisations to better plan the servicescape and to be able to empower their customers and employees alike.

By offering a CCI typology and identifying value creation opportunities in each quadrant, this research is expected to contribute to further studies, especially with a more empirical nature, on the implications of CCI to service operations.

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