How advocacy and interactivity facilitate customer value co-creation behaviour in Instagram:

a micro-perspective of unplanned and voluntary usage of hedonic social networking sites

Doctoral Programme in the Information and Knowledge Society

- Doctoral thesis directors: Dr Inma Rodríguez-Ardura and Dr Antoni Meseguer-Artola
- Doctoral student: Ramón Gutiérrez Sánchez
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> *" These (social) networks, which could not exist on such a large scale without the medium provided by new information technologies, are the emerging organisational form of our world"* (Castells, 1989:32).

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Chapter 1. Introduction and objectives

This doctoral research studies immersive experiences of value co-creation and increased advocacy levels that appear amongst customers who interact with other customers in hedonic social networking sites (SNSs), such as Instagram. This study is situated in the areas of digital marketing and social e-commerce (Zhang & Benyoucef, 2016).

The first chapter of this thesis dissertation starts with an introduction, then continues with the justification of interest, followed by descriptions of the main goal and objectives of the study, the research problem, a concise account of the context of the study and a brief explanation of the structure of this document.

1.1. Introduction

Social e-commerce is a concept that originated in 2005 in the area of digital marketing and is defined, in this thesis, by its factors and its potential research directions concerning the individual behaviour of the customer who interacts with other peer customers in hedonic SNSs (Chen, Hsiao, & Wu, 2018; Hajli, 2013; Wang & Zhang, 2012). In fact, a closer look at the multiple concepts of interactivity shows a collection of existing definitions that focus on the question of whether a particular medium is interactive or not (Krishen, Dwivedi, Bindu, & Kumar, 2021; Macias, 2003; Zhu, Zhu, & Hua, 2019).

In view of this, we follow Gallagher (2007) and take a computational approach to actor-to-actor disembodied interaction, during immersive experiences of value co-creation and increased advocacy levels in hedonic SNSs, from the perspective of information systems and in the context of service science (Battacherjee, 2001; Lusch & Vargo, 2006a; Vargo & Lusch, 2008c).

We adopt the notion of inter-subjectivity[1] proposed by Löbler (2011) and Ricœur (1983) to study customer-to-customer (C2C) interaction in engagement platforms, such as the hedonic SNS of Instagram. Accordingly, this doctoral research examines: (1) the interaction of users with other users of hedonic SNSs that triggers customer value co-creation behaviour (Kao, Yang, Wu, & Cheng, 2016; Ketonen-Oksi, Jussila, & Karkkainen, 2016); (2) the social and psychological factors that mediate during users' immersive experiences in hedonic SNSs (Wu, 2006); and (3) the unplanned and voluntary usage of hedonic SNSs that leads to the generation of increased advocacy levels in users (Ajzen, 1991; Ercsey, 2016).

Our research develops a theoretical framework to analyse how and why the co-creation of value emerges during the interaction amongst users of the hedonic social SNS of Instagram (labelled *instagrammers*) under the theory of the service-dominant logic.

We focus on two factors in the generation of users' value during immersive experiences in hedonic SNSs, that are of great economic and social interest to businesses and firms. These factors are

[1] Inter-subjectivity is a type of subjectivity between two actors that is closer to objective than to subjective experience or phenomena, and it is the result of the interaction of the actors with the world (Davidson, 2001). He argued that reality is essentially the result of the behaviour of actors, and it is caused by actors interact with each other through intensional states that are actors' patterns of behaviour. Actors perceive the patterns of behaviour in other actors: their purpose is to encapsulate a large amount of information into manageable data that helps to predict other actors' future behaviour. Under intensional states, actors speak through intensional language (Favereau, 2005) that is based on the notion of a stream or trail of meaningful messages: each message responds to a previous message. Phenomenologically there is a physiological basis for inter-subjectivity, since there are *mirror neurons* mechanisms that allow the sharing of mental states between actors (Ferrari & Gallese, 2007; Iacoboni, 2008; Lohmar, 2006).

customer value co-creation behaviour (Prahalad & Ramaswamy, 2000, 2004) and increased advocacy levels towards businesses and firms:

1. Brands and businesses need to generate customer value co-creation behaviour in hedonic SNSs during user-to-user service interactions, because actor's interactivity is phenomenologically (Levin, Husserl, & Findlay, 1972), a significant source of value (Prahalad & Ramaswamy, 2002).

2. Also, they need to increase users' advocacy levels towards businesses and firms by enabling and facilitating the unplanned and voluntary usage of hedonic SNSs. This is due to the fact that sharing and exchanging users' resources that are embedded in a broader service ecosystem (such as skills, knowledge and relationships) is another important source of value (Laud & Karpen, 2017).

What motivates our analysis of customer value co-creation behaviour, and its links with increased advocacy levels[2], is the identification, classification, and analysis of the sources of value generated by customers during immersive experiences in engagement platforms, such as the hedonic SNS of Instagram.

Under the service-dominant logic, hedonic SNSs connect actors through physical and digital means (Bolton *et al.*, 2018) and processes and activities (symbols and meaning). The configuration of patterns during C2C interactions is delimited in time, space and the socio-economic context, and it forms the choreography[3] that frames the architectural aspects of engagement (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016).

Then, our research develops a conceptual model to analyse the type of users' resources that are embedded in a service ecosystem, such as skills, knowledge and relationships. Social and economic actors – who are users acting as customers in a service ecosystem – integrate resources during interactions and exchanges with other actors in engagement platforms (Peters *et al.*, 2014), such as the hedonic SNS of Instagram (Aarikka-Stenroos & Ritala, 2017).

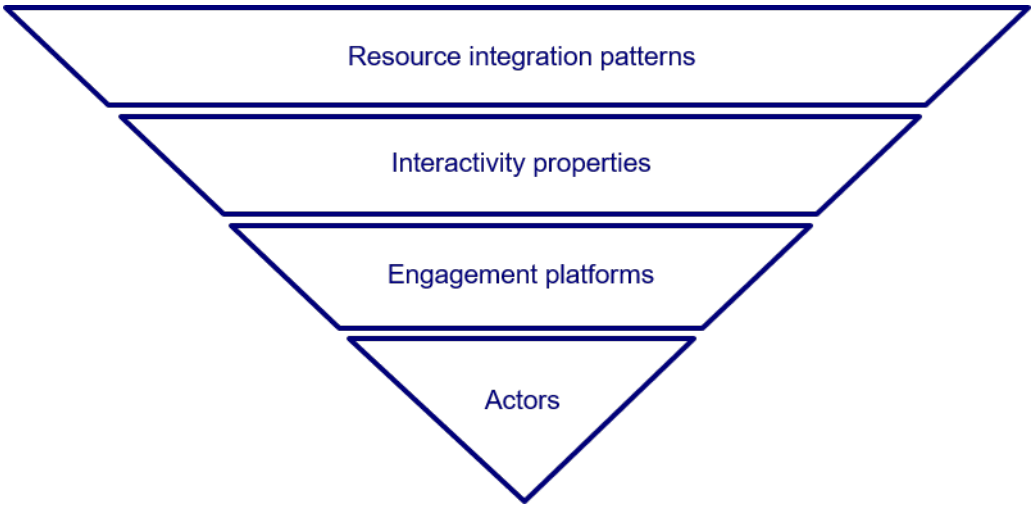
By using a confirmatory modelling strategy (Hair *et al.*, 2010), we test our model. In the model, we stratify (that is, we hierarchically consider) the relevant strategic management concepts functioning within C2C interactions in social e-commerce (Baghdadi, 2016; Mathis, Kim, Uysal, Sirgy, & Prebensen, 2016; Wang & Yu, 2017).

We adopt the strategic management concepts used under the service-dominant logic and service systems (Grotherr, Semmann, & Böhmann, 2018; Mele & Polese, 2011) that are relevant in the social e-commerce context of our research: actors, engagement platforms, interactivity properties and resource integration patterns (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016) (see Diagram 1).

[2] Increased advocacy levels is an 'umbrella concept' that includes the antecedents of customer citizenship behaviour that depend on the unplanned and unvoluntary usage of SNSs. For example, it incorporates positive affect (Yi & Gong, 2006, 2008).

[3] Choreography helps to connect users, processes and activities – that generate engagement platforms (pattern) configuration in relation to time, space and context – to prompt engagement in users (Storbacka *et al.*, 2016).

Diagram 1. Strategic management concepts in social e-commerce



We also identify relevant social (behavioural) and psychological (cognitive and emotional) factors driving user's engagement in hedonic SNSs (Brodie, Hollebeek, Jurić, & Ilić, 2011; Brodie, Ilic, Juric, & Hollebeek, 2013; Vivek, Beatty, & Morgan, 2012). We examine the emotional and rational responses generated by engaged actors during value co-creation experiences in the context of the hedonic SNS of Instagram (Hollebeek, 2013; Ketonen-Oksi *et al*., 2016).

We consider user's engagement as a particular cognitive case of actor's interactivity (Aroean, Dousios, & Michaelidou, 2018; Gonçalves, da Silva, & Teixeira, 2019). In fact, Barari, Ross, Thaichon, & Surachartkumtonkun (2020:44) have called for studying *'the new business models, such as the sharing economy, (where) engagement emergence and manifestation take place in a complex network of interaction between different actors'*. Also, Brodie, Hollebeek, & Jurić (2011) and Chandler & Lusch (2015) stated that the role that actors play during engagement in a service ecosystem is a particular case of interactivity; and Chandler & Lusch (2015) asserted that interactivity is comprised of the internal disposition[4] and the external connections of the actor during activities in a service ecosystem.

Value is co-created when actors engage with other actors during resource integration (Bruce, Wilson, Macdonald, & Clarke, 2019). Value co-creation results from actors' willingness to engage (Assiouras *et al*., 2019) and their activities when integrating resources in a service ecosystem (Storbacka *et al*., 2016). This behavioural conception of co-creation implies that actors' engagement is a particular instance of actors' interactivity during the integration of resources embedded in a service ecosystem (Laud & Karpen, 2017).

We also consider that the most valuable customers are not necessarily those who buy a lot, but those who help other customers online or who speak highly of the brand in social media (Smith & Zook, 2011). Furthermore, we define customers as people who draw on and integrate a wide

[4] The notion of the internal disposition of an actor is a human psychological condition that differs from the same notion of a machine actor (Brodie, Hollebeek, & Jurić, 2011; Chandler & Lusch, 2015). The main distinction is intentionality, which is an integral component of human agency. Human agency has intentionality, whereas material agency has no intentionality (Leonardi, 2012; Pickering, 2001). Technology is based on machine entities of the service system, which is mainly controlled by humans actors that have privileges over machines (Spohrer *et al*., 2008). Drivers for internal disposition in value co-creation are the actor's engagement quality, a nurturing environment, growth opportunities, customer ownership and customer's willingness to co-create (Potdar, Waseem, & Garry, 2019).

variety of market resources gathered from specific touch-points with the brands. As a result, they may need to navigate an array of separate and layered service encounters (Epp & Price, 2011; Rawson, Duncan, & Jones, 2013). Consistently with this, customer behaviour comprises: *'retention and cross-buying (…) sales and transaction metrics…word-of-mouth (…) customer recommendations and referrals (…) blogging and web postings (…) and many other behaviours influencing the firm and its brands'* (van Doorn *et al.*, 2010:253).

Interactions generated between the brand and valuable customers are exploited as favourable opinions, debates, evaluations and expressions of feelings in hedonic SNSs, like Instagram, owing to the engagement properties of the collaborative co-creation process (Veloutsou & Ruiz-Mafe, 2020). This behavioural process suggests that engagement is a particular instance of interactivity, aiming at value creation in SNSs, where customers can exchange ideas and express their feelings towards brands (Hollebeek, 2011).

Finally, we argue that, during value co-creation, interactive (service) systems should provide rich and distinct experiences that generate value (Canas, 2014; Stevens & Boucher, 2016). This argument implies that interaction systems are essential in value co-creation during immersive experiences.

1.2. Justification of interest

In Western societies, the conception of the socio-economic model of production has shifted from *'a goods-dominant view'* to *'a service-dominant view'* (Vargo & Lusch, 2004:2). Dominant logics are psychological patterns that drive an actor's cognition within an organisation and are mediated by collective norms, values and beliefs. This service-dominant logic perspective considers that new types of value propositions are co-created by firms with the customer in mind (Saarijärvi, 2012), and it configures as a lens through which the phenomena of social and economic exchanges can be better observed and performed (Vargo & Lusch, 2004). Accordingly, it helps businesses deliver new policies and strategically build new ventures (Ford & Bowen, 2008; Pels, 2012; Subramony & Pugh, 2015).

The transformation of the model of production is greatly due to the ascent of social media, the prevalent use of all types of mobile technology and the secured introduction of the internet of things and artificial intelligent mechanisms in everyday life (Smith, Dhillon, & Carter, 2021). As a result, immersive interactive environments have become ubiquitous, and they have rapidly turned into engagement platforms for value co-creation. With the term *'interactive environment',* we refer to the state of *'being immerse'* in the virtual environment designated by the hedonic SNSs of Instagram and the state of *'being together'* with other Instagram users (Leavy, 2013:14). However, few papers have studied empirically customer value co-creation behaviour in this focal context (Jaakkola, Helkkula, & Aarikka-Stenroos, 2015; Li, Juric, & Brodie, 2017). In addition, the key factors that trigger users' interactivity during value co-creation in Instagram have been underexplored.

Broadly, firms and marketers at the forefront of innovation advocate for changing their organisations from goods-oriented approaches to service-oriented ones (Chandler, Danatzis, Wernicke, Akaka, & Reynolds, 2019). Parallel to this, businesses and firms have moved from the industrial economy to the service economy (Castells, 2000) due to the processes of globalisation, technological development and the demand of customers for new services (Kutsikos, 2009). Based on this, they increasingly facilitate interactivity to users of hedonic SNSs.

As a result, the number of users who interact with their peers has increased, along with the number of interactions. This implies that higher levels of interactivity can lead brands and firms towards more open innovations (Dahlander, Gann, & Wallin, 2021; Randhawa, Wilden, & Hohberger, 2016), which in turn generate new social structures, new technical developments and, ultimately, the transformation of markets (Reypens, Lievens, & Blazevic, 2016).

The market is no longer conceived as a mere place where supply and demand meet, but as a space in which customers integrate their personal resources to jointly create value (Storbacka & Nenonen, 2011), especially for new micro segments of customers (see Figure 2, in section 2.3). In other words, in new markets, *'the customer is always a co-creator of value'* (Vargo & Lusch, 2008b:148): they integrate their personal operant resources during customer value co-creation behaviour to generate value-in-use and value-in-context (Madhavaram, Granot, & Badrinarayanan, 2014). With the adoption of a service-dominant logic perspective by businesses and firms, resources and processes for resource integration are no longer scarce, but are widespread in service ecosystems (Akaka & Vargo, 2014).

We study these new markets and open innovation initiatives[5] (Randhawa, Wilden, & Hohberger, 2016) in engagement platforms operating as hedonic SNSs, where value is generated by the social mechanisms used by customers that interact with their peers. We do so by adopting the micro-foundation of customer value co-creation behaviour view and the theory of service-dominant logic.

On the one hand, a micro-foundation view of value co-creation considers the interactive process through which the resources embedded in a service ecosystem are integrated (Laud, 2015). On the other hand, the theory of service-dominant logic conceives customer behavioural patterns of co-creation and co-destruction as sources of competitive advantages, which maximise satisfaction and returns (Frasquet-Deltoro, Alarcón-del-Amo, & Lorenzo-Romero, 2019).

However, a review of existing theories of customer behavioural patterns during mutual interaction in hedonic SNSs like Instagram, identifies inconsistencies, deficiencies and contradictory findings (Dhaka, 2015).

To address this issue, we develop an internally coherent theoretical framework. This theoretical umbrella considers the type of actor-to-actor interaction that leads to value generation in engagement platforms, the service-dominant logic, as defined by Vargo & Lusch (2006, 2008), as well as the information systems and service science perspectives of service ecosystems (Grace, Finnegan, & Butler, 2008).

The reasons that have lead us to use the theory of the service-dominant logic (Vargo & Lusch, 2006, 2008) are threefold:

1. This theory helps to understand how and why users of hedonic SNSs, such as Instagram, interact with other users, thus facilitating users' mutual experiences of customer value co-creation behaviour during unplanned and voluntary usage (Chen & Vargo, 2010).

[5] The research uncovers three branches of research in open innovation: first, business-focused aspects of open innovation; second, open innovation network management; and third, the roles, individually and aggregated in communities, played by users. Most research on business-centric innovation focuses on the role of *'knowledge, technology, and R&D'*. However, many scholars propose to fill the gaps in knowledge of open innovation research in the areas of: *'marketing (e.g., service-dominant logic), organisational behaviour (e.g., communities of practice) and management (e.g., dynamic capabilities)'* (Randhawa, Wilden, & Hohberger, 2016:750).

2. It allows us to identify the drivers of usage of engagement platforms, such as hedonic SNSs, and the resources embedded in broad service ecosystems (Smith & Ng, 2012). An increased number of users' interactions with resources facilitates increased advocacy levels, and thus creates a *'networked market'* (Nenonen & Storbacka, 2010:9).

3. It facilitates the identification of the patterns and mechanisms for integrating customers' resources, such as skills, knowledge, and relationships, which are forms of human and cultural (Bourdieu, 1986) and social capital (Coleman, 1990) operated by actors in hedonic SNSs like Instagram. For example, Storbacka *et al.* (2016) have stated that resource integration patterns are the distinct results of the combination of three elements: (1) each group of actors has a unique set of dispositions, and, as the actor changes, so it does his or her internal disposition; (2) the use of multiple interactive platforms; and (3) interactivity observable characteristics (properties or factors) that are measurable.

According to the service-dominant logic, users interact through service exchanges to improve the coping of, and the survival capacity of, all exchange service systems[6] (Grotherr *et al.*, 2018), and also to allow the integration of resources that are of mutual interest to users (Lusch & Vargo, 2006). Due to the interplay of users and the resilience of services, better service system exchanges can be produced that facilitate the integration of all mutual and beneficial resources (Vargo *et al*., 2008).

Similarly, the integration of users' personal resources that are mutually beneficial, improves the adaptation, survival and the benefit of all service (eco)systems committed to value propositions[7] (Saarijärvi, 2012). The integration of resources, which are internal or external to the engagement platform, in a service-for-service exchange is the basis for value co-creation; hence value co-creation is linked to: (1) the type of resources, such as new knowledge; and (2) the type of services that are on offer in a service (eco)system, such as best practices (Kutsikos, 2009).

For that reason, we oppose the goods-dominant logic, which establishes that: (1) goods are tangible objects that contain value and are the core of exchanges; and (2) services add value to the goods. We also oppose the service-logic that limits exchanges solely to firm-customer interactions (Vargo & Lusch, 2008c; Vargo & Lusch, 2008b; Kutsikos, 2009).

Therefore, we use a service-dominant logic theoretical framework to explain the differences between service-dominant logic and service-logic in: (a) customer value co-creation behaviour; (b) interactivity; and (c) the link between customer value co-creation behaviour and interactivity. Also, we complement the theory of service-dominant logic with a micro-perspective view of interactivity in engagement platforms.

[6] Vargo, Maglio, & Akaka (2008) considered that: (1) service is based on exchange, and is understood as the application of capabilities such as knowledge and skills, by actors for the benefit of other actors; (2) the appropriate unit of analysis for service-for-service exchanges is the service (eco)system, formed by resources (people, information and technology) linked to other systems through value propositions; and (3) service science is the research of service (eco)systems and the joint creation of value in complex resource structures. Notwithstanding, we consider the individual customers, and not the service (eco)system, the unit of analysis in our study.

[7] Irrespective of the type of business, firm's service provision to customers is channelled through value propositions. By listening to customers, firms can generate and offer better value propositions to customers. In turn, customers not only produce value-in-use and value-in-context to the service, but also can make value propositions. This process is beyond traditional dyadic exchanges between the firm and the customer (Chandler & Vargo, 2011; Li, Juric, & Brodie, 2017).

1.3. Main goal and objectives

We study customer value co-creation behaviour processes in social media under the service-dominant logic, and we identify the key factors that drive users towards unplanned and voluntary usage of hedonic SNSs. As a result of these processes, users of engagement platforms, such as the hedonic SNS of Instagram, integrate their personal operant resources (Vargo & Lusch, 2017), that are embedded in a broader service ecosystem (Laud & Karpen, 2017), and jointly co-create with other users value-in-use and value-in-context.

Extant research on customer value co-creation behavioural processes focuses on: (1) the context of service ecosystems of specific attributes and resources; (2) the use of operant resources, such as skills, knowledge and relationships; and (3) C2C interactions (Booth, Colomb, & Williams, 2003; Chung & Zhao, 2004; Denscombe, 2012). However, our main goal is to better understand customer value co-creation[8] behavioural patterns within hedonic SNSs like Instagram, which have been underexplored in the literature (Yi & Gong, 2013). More specifically, we seek to examine customer citizenship behaviour and interactivity (Rafaeli, 1988; Steuer, 1992) as key antecedents for customer value co-creation behaviour, during the integration of users' operant resources (Singaraju, Nguyen, Niininen, & Sullivan-Mort, 2016).

In the pursuit of this central goal, we strive to meet seven interrelated research objectives, each of them related to one facet or level of immersive experiences of value co-creation in Instagram. We apply Coleman's (1990) bathtub model for social interaction as a micro-foundation of customer value co-creation behaviour under the service-dominant logic to identify and address these objectives, which are the following:

1. To offer a theoretical framework at the macro-level and the micro-level views of the components of unplanned and voluntary customer behaviour in engagement platforms, which leads to increased advocacy levels (Yi & Gong, 2006, 2008) in Instagram's SNS.

2. To build a conceptual and integrated model of customers' value co-creation behaviour, interactivity and increased advocacy levels of Instagram. The model will be aligned with the service ecosystem theory and the service-dominant logic (Vargo & Lusch, 2004b).

3. To analyse and measure the cause-effect relationship between the extra-social role – related to the network effect of customer citizenship behaviour – and the intra-personal role – related to individual factors of customer participation behaviour (Yi & Gong, 2013) – that is affected by voluntary and unplanned usage during immersive experiences of value co-creation in Instagram.

4. To analyse the relationship between the extra-social, network-related effects of interactivity (Rafaeli, 1988) with the intra-personal, psychological factors of perceived interactivity (Steuer, 1992) in Instagram.

5. To test empirically the causal paths (Coleman, 1990), appearing in the integration of personal operant resources that lead to customer value co-creation behaviour under the service-dominant logic.

[8] A search using the ISI Web of Science in June 2020 returned 40,530 articles on service ecosystems published in JCR-indexed journals; however, 213 of them adopted a service-dominant logic framework of analysis, 75 referred to SNSs, and only 42 referred to customer value creation behaviour.

6. To establish whether users integrate the operant resources of skills, knowledge and relationships due to the factors of information seeking, information sharing, responsible behaviour, and personal intention in customer participation behaviour.

7. To empirically examine the relationship between micro and macro-levels and extra and intra-roles in the conceptual model.

See section 5.2 and Figure 17 at the end of this thesis dissertation for the conclusions to this list of objectives; we have ensured that the main points presented in the conclusions are consistent with what is stated in this list of objectives.

1.4. Research problem

Our research problem refers to how and why incrased advocacy levels and interactivity facilitate immersive experiences of customer value co-creation behaviour in hedonic SNSs, like Instagram. To offer answers to this research problem, we will explore and explain interactivity amongst customers and how it leads to higher levels of advocacy during unplanned and voluntary usage of hedonic SNSs, like Instagram.

We conceive interactivity as a micro-foundation (Harmon, Haack, & Roulet, 2019) of value co-creation during unplanned and voluntary use. When applied to institutional research, a micro-foundation perspective studies phenomena at the macro-level through iterative analysis at the micro-level, as in the Coleman bathtub (1990), whose basic principle is to apply an individualistic methodology to social action (Felin, Foss, & Ployhart, 2015). The interactivity of actors is an iterative process, in which temporal dynamisms *'extend the spatial, contextual, relational and informational properties'* (Storbacka ***et al.***, 2016:3013).

We identify a gap in the research of interactivity, particularly in the relationship between the social factors (network interactivity), and the psychological factors (perceived interactivity). We bridge this gap in two ways: by organising the social and psychological factors (and their dimensions) rationally and significantly, and empirically studying the link between value co-creation and interactivity.

Under the service-dominant logic theory, value is co-created when users integrate their personal operant resources during interactions with other users (Vargo & Lusch, 2006; 2008). Vargo, Maglio, & Akaka (2008) claimed that customers integrate resources during the co-creation of value process, if this is studied from the customer's perspective instead of the firm's perspective. We shed light on users' motivations to co-create during immersive experiences in hedonic SNSs, like Instagram. These motivations are the degree of knowledge, the belief in achieving a result, the interest in involving users in co-creation, and the role of the customer in resource integration during the co-creation experience (Im & Qu, 2017).

In addition, several informational, relational, and motivational aspects moderate co-creation activities (Lu, Fan, & Zhou, 2016). The exchange of information, social support and the quality of the relationship can, directly and indirectly, affect brand co-creation, while privacy concerns affect information sharing on brand co-creation (Tajvidi, Richard, Wang, & Hajli, 2018).

1.5. Instagram, the context of the research

Instagram is one of the most popular hedonic SNSs globally, especially amongst younger users, such as millennial's and members of the Z generation. Global data gathered by Statista (2020) shows that 35% of the instagrammers range from 25 to 34 years old, closely followed by people of ages 18-24 (30%) and 35-44 (16.5%). Currently, Instagram is the desired social network amongst young people, surpassing Twitter, TikTok and Facebook in the number of users.

Instagram allows users to navigate and share visual content quickly. It makes it easy to edit images and videos, which can be uploaded directly from the phone, either immediately (after obtaining the picture) or later, after editing. Also, Instagram lets users upload and process images and videos through filters before posting or sharing them on other SNSs, such as Facebook, Twitter or TikTok. Filters provided by Instagram or photo editing apps increase the quality of posts, providing a more professional look (Kleemans, Daalmans, Carbaat, & Anschütz, 2018).

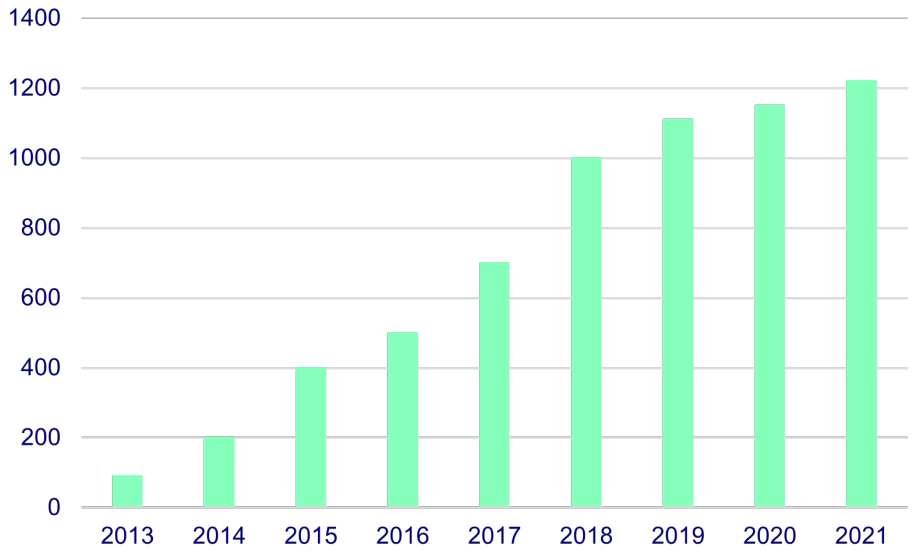
Although Instagram is a visual SNSs, there are some similarities in the functionality and design of Instagram and Twitter, as they are both asymmetric SNSs. This asymmetry means that one user can follow another user, but the second user does not need to follow the first user. Furthermore, this asymmetry implies that users can indefinitely post or publish what other users want to follow, increasing the number of followers (Pringle, 2018). Also, the feature known as *Instagram Stories* is remarkably similar to the *My Story* feature in Snapchat, as Kevin Systrom, founder of Instagram, has recognised. Users can create and guide short 15-second videos that automatically disappear after 24 hours of publication. Users can also add drawings, stickers and emojis to decorate their videos.

Another relevant feature of Instagram is that users can segment their audience with privacy options, which encourages the creation of content directed to a specific segment (Salminen *et al.*, 2018). In addition, there is the feed, where each user gathers all the publications (photos and videos) of the instagrammers they follow. The most prominent posts appear in the feed according to the Instagram algorithm, although it is possible to return posts to the chronological order at any time.

Another essential feature is that instagrammers can create content and generate added value if they like or comment on other users' publications or posts. In addition, Instagram has a tracking update page where users can see their activity, i.e., which publication they liked, who and if they have commented, and their followers' activity. This feature lets users know more about other users who follow them, such as their tastes or to whom they are related (Gillespie, 2016).

Besides, instagrammers can learn where the most recent or popular posts are located according to the users with whom they interact (Handayani, 2016) and the lifestyle, tastes and hobbies of a particular type of user, as well as their favourite brands (Maares & Hanusch, 2018).

Figure 1. Number of monthly active Instagram users from January 2013 to January 2021 (in millions)



Source: Statista (2021a).

Instagram is a highly hedonic SNS that fosters significant interaction amongst its users (Gong, 2015). With the integration of new users, the Instagram community has grown exponentially compared to other hedonic SNSs. As a result, it is the fastest growing and evolving hedonic photography-based SNS. Figure 1 shows the number of monthly active users on Instagram as of January 2021. In that month, Instagram reached 1.22 billion active users, gaining 110 million users since January 2019 (Statista, 2021a). This growth can be compared with 999 million users in June 2018, 800 in September 2017 and 600 million users in December 2016. In 2021, it was the fifth most used SNS, after Facebook, YouTube, WhatsApp and Facebook Messenger. Considering that the number of connections on a network is the factorial (!) of the number of users, the number of possible connections is the factorial amount of 1.220.000.000, or 1.220.000.000!

As the nature of Instagram is to share images, and the application has a high rate of interaction, it is a powerful marketing tool in social networks for companies. For example, in December 2019, 96% of US fashion brands had an active Instagram profile (Statista, 2020). To the best of our knowledge, the role of social and perception factors in the interaction amongst Instagram users, whether in images or video formats (Zhang, Zhou, Briggs, & Nunamaker, 2006; Zhao & Lu, 2012), is to promote a more positive attitude towards the brand and its digital website.

1.6. Structure of the dissertation

In this thesis, we elaborate a theoretical and empirical study of the micro-foundation for customer value co-creation under the service-dominant logic in hedonic SNS, like Instagram, which has lead us to: (1) develop a theoretical framework; (2) build a conceptual model; (3) design a measurement instrument; (4) collect primary data; (5) test the model empirically by using a structural equation modelling (SEM) methodology; and (6) derive contributions to the theory and managerial implications.

The thesis is comprised of five chapters, starting with the current introductory chapter. The second chapter develops our theoretical framework, where we examine the driving factors that might lead to co-creation and interactivity. The third chapter describes the conceptual model and our hypotheses about the associated mechanisms connecting value co-creation with interactivity. Chapter four presents the SEM analyses performed. Finally, the conclusions of our study are commented on in chapter five.

This first chapter has introduced the research topic, with the justification of interest, research objectives, the research problem, the context of our empirical study, and the structure of this thesis.

The second chapter presents the theoretical framework and a conceptual delimitation of the key constructs in our theoretical model:

- In section 2.1, we critically review the theories and concepts related to the configuration of hedonic SNSs under the service-dominant logic.

- In sections 2.2 through 2.6, we examine the different theoretical frameworks considered (such as service-dominant logic, service-logic and goods-logic), followed by the most relevant sociological theories (such as the structuration theory and the social mechanisms involved in the study of online customer behaviour); also, we review the internal and external factors that support our integrated approach to customer value co-creation behaviour.

- In section 2.7, we address the construct of customer value co-creation behaviour and, after its conceptualisation, we identify and describe in detail its most relevant dimensions influencing resource integration in the context of the hedonic SNS of Instagram.

- In section 2.8, we examine the extant literature on the concept of interactivity in online immersive environments; we study how the micro-level view of interactivity is based simultaneously on different paradigms, such as the computer-mediated communication taken from the communication theory and the human-computer interaction taken from the field of cognitive psychology. Then, we adapt the concepts – clarify their meaning and classify their dimensions – into operational constructs for our empirical research.

- In section 2.9, we adopt the micro-foundation view facilitated by Coleman's (1990) bathtub, under the service-dominant logic, to study customer's immersive experiences of value co-creation across different digital platforms interconnected in a service ecosystem. Also, relevant theories, such as rational choice theory, social capital theory and the theory of planned behaviour (Ajzen, 2020) are considered.

The third chapter introduces our conceptual model and the research hypotheses. Our model describes the social mechanisms involved in the joint creation of value by integrating personal operant resources of customers during unplanned and voluntary usage of the hedonic SNS of Instagram. The elaboration of our conceptual model starts in section 3.1, by presenting the macro-micro links between the constructs of value co-creation and interactivity described in chapter 2 (sections 2.7 and 2.8). Sections 3.2 through to 3.6 present and justified the research hypotheses, all related to the relationships included in the model.

The fourth chapter describes our empirical research by explaining the SEM methodology, as well as the results of the online survey. All the steps involved in the data gathering process are described in-depth, particularly the sample size and the sampling method (sections 4.2 and 4.3). Also, the validations of the measurement scales are commented on in section 4.4; and the SEM analyses of the hypothesised relationships are explained in sections 4.5 and 4.6. The analysis of the data collected will allow us to validate all the hypotheses in the conceptual model.

The fifth chapter presents the conclusions, including an executive summary of the study in section 5.1, the main discussion and findings, and the contribution to the research in digital marketing (sections 5.2 and 5.3). Implications for relevant stakeholders are discussed in section 5.4, ethical considerations are addressed in section 5.5, and limitations of the study are unveiled in section 5.6. Finally, we conclude this thesis with suggestions for future lines of research in section 5.7.

Chapter 2. Theoretical framework

This chapter is divided into two parts. In the first part, we discuss relevant theories and key concepts applicable to explain the configuration and the inter-operability of the hedonic SNS of Instagram, such as the service-dominant logic, structuration theory, value configuration space and the social mechanisms that lead to value generation. Therefore, the chapter starts with the theoretical background based on the micro-foundation movement (section 2.1), then it continues with the service-dominant logic theoretical framework (section 2.2), structuration theory, value configuration space and a detailed description of the social mechanisms involved in value co-creation (section 2.3).

In the second part of this chapter, we identify and study the factors that trigger the joint creation of value during interactions amongst users of Instagram's hedonic SNS. To accomplish this, we take a micro-perspective of interactivity to study how users integrate their operant resources that are embedded in a broader service ecosystem during immersive experiences in Instagram. We adopt an integrative approach to customer value co-creation behaviour (section 2.4), which considers service ecosystems (section 2.5), the role of resource integration (section 2.6) and the process of value co-creation (section 2.7). We also embrace a micro-perspective of interactivity (section 2.8) and use the Coleman bathtub as a micro-foundation to study customer value co-creation behaviour (section 2.9).

2.1. Theoretical background

In this section, we explain the theories and concepts that have given us theoretical foundations to build our conceptual model. We follow the micro-foundations movement in strategy and organisation theory (Felin, Foss, Heimeriks, & Madsen, 2012; Felin & Foss, 2005; Foss, 2016).

Studies on the configuration of SNSs started in the mid-1990s, with the economic study of endogenous structures[9] or networks that result from the individual actor that creates, maintains or destroys links with other actors (Dutta & Jackson, 2003; Jackson, 2008). Two different points of view, or models, were developed in this period: the macro-level perspective, which emphasises groups of actors and their grouping effects in the network; and the micro-level view, which focuses on actor-to-actor links and their individual effect on the network.

The assumptions at the macro-level involve the identification of *'meeting places of actors'*. The assumptions on the links between actors are *'bridge assumptions'*, and they involve the creation of value as a result of the actors' position in the network, where some positions *'with more structural holes'* (Raub, Buskens, & van Assen, 2011:13) are more valuable than others (Burt, 2009; Buskens & van de Rijt, 2008).

The assumptions at the micro-level imply *'bounded rationality'* where an actor creates connections that are directly advantageous, but does not take into account the subsequent modifications of other actors or him or herself after the links are created (Raub, Buskens, & van Assen, 2011:13).

The results at the macro-level of these models are inequalities, inefficiencies or Pareto sub-optimality, although they are unintentional outcomes of independent actors that create links with

[9] Research on the formation, or the *emergence*, of social networks has been published since mid-90s in the Journal of Mathematical Sociology, attracting the attention of economists (Dutta & Jackson, 2003; Jackson, 2008; Raub, Buskens, & Van Assen, 2011) towards theories and concepts of the configuration of SNSs. SNSs are endogenous macro-micro level structures (Raub, Buskens, & van Assen, 2011). These authors argued that networks are considered endogenous structures resulting from the individual behaviour of actors who connect or disconnect from other actors due to: (1) macro-level conditions; (2) micro-level conditions; and (3) macro-outcomes.

other actors (Doğan, van Assen, van de Rijt, & Buskens, 2009). To a large degree, these macro-level outcomes rest on the evolution of the links between actors at the micro-level, such as the assumptions of the links and the *'transformation rules'* (Raub, Buskens, & van Assen, 2011:13). For example, if an actor makes one change at a time[10] or several changes simultaneously, in the creation of links or the order of the links, then these micro-level actions have an effect on macro-level outcomes.

2.1.1. The creation of new markets due to open innovation

The service-dominant logic emerges as a counterargument to the goods-dominant logic and the service-logic, also referred to as the Nordic School. The study of value co-creation, under the service-dominant logic, enables us to consider the perspective of the customer (Vargo & Lusch, 2008a, 2008b, 2008c, 2004) and emphasises the importance of interactivity and the relevance of service exchanges amongst customers during value co-creation (Vargo & Lusch, 2006).

The service-dominant logic-based framework illustrates how service ecosystems facilitate innovation, which has been defined *'as a process that unfolds through changes in the institutional arrangements that govern resource integration practices in service ecosystems'* (Koskela-Huotari *et al.*, 2016:2964). The service-dominant logic applied to the research of service ecosystems studies how innovation in social structures and institutions is achieved through interactions amongst multiple actors that exchange services and integrate resources, thus leading to market reform (Vargo, Wieland, & Akaka, 2015). According to this framework, both organisations and customers that remain at the forefront of the production of material and immaterial goods and the exchange of tangible and intangible services are driven by innovation that facilitates social structures and institutions (Hollebeek & Andreassen, 2018).

We study how and why users of hedonic SNSs, such as Instagram, collaborate and interact with other users to generate content (Ketonen-Oksi *et al.*, 2016; Singaraju *et al.*, 2016). The content generation process is achieved using tangible and intangible elements that facilitate the interaction of actors with resources available in hedonic SNSs, like Instagram.

- Tangible elements form an engagement platform: tangible elements constitute the substance and materialisation of customer engagement, which can identify which users' exchanges and bundled resources are more valid to innovate (Breidbach, Brodie, & Hollebeek, 2014).

- Intangible elements form interactive and service platforms: intangible elements are the (social) rules of exchange patterns that are clearly delineated to accelerate the give-and-take of services and the integration of resources embedded in service ecosystems (Lusch *et al.*, 2016).

Studies on service ecosystems, service platforms, and value co-creation developed under the perspective of content generation have the potential to increase effective and valuable knowledge

[10] The characteristics based on time are a key component of interaction. Actor's interactivity fluctuates with respect to the duration of the interaction (Fuller, 2010) from one time through repeated interaction to regular use. Duration is essential in order to engage actors in the chosen channel. A single interaction occurs in a single channel, while continuous interaction can take advantage of several channels that can maintain a more regular interaction. Therefore, more consideration is given to *'frequency, regularity, recency and concurrence'* (Chandler & Lusch, 2015:5) than that is attributed to events that do not occur sequentially.

on service innovation (Hollebeek *et al.*, 2018a; Chahal, Wirtz, & Verma, 2019). We argue that the framework presented in our study of service ecosystems, service platforms, and value co-creation facilitates service innovation (Colurcio, Caridà, & Edvardsson, 2017; Lusch & Nambisan, 2015)

For instance, we claim that open innovation (Bogers, Chesbrough, & Moedas, 2018) is generated by the interaction amongst actors in engagement platforms, whose resources are embedded in broader service ecosystems (Vargo *et al.*, 2016). These resources, which are integrated, exchanged and applied by actors using digital technologies and media (Nenonen & Storbacka, 2018), facilitate market reformation (Vargo, Akaka, & Wieland, 2020). Open innovation is the purposeful *'use of inflows and outflows of knowledge to accelerate innovation and the expansion of markets, for the external use of innovation'* (Chesbrough, 2006:2). From this perspective, research can be considered a service (Bogers *et al.*, 2018).

Our conceptual model addresses the issue of open innovation generation (Naseer, Khawaja, Qazi, Syed, & Shamim, 2021) for market reform: organisation and businesses can create and manage new markets for their own benefit by accelerating interaction amongst customers (Randhawa, Wilden, & Hohberger, 2016) in hedonic SNS, like Instagram. Therefore, customers operating as actors with increased levels of interactivity can facilitate open innovation generation (Bharti, Agrawal, & Sharma, 2014).

2.1.2. Open innovation in engagement platforms

Businesses and brands help users generate new value propositions through open innovation (Aal, Di Pietro, Edvardsson, Renzi, & Mugion, 2016; Vargo, Wieland, & Akaka, 2016), whenever users participate in immersive environments. Immersive environments are constantly evolving, providing users with ever-changing original interactive experiences, increasing users' imagination (Rafaeli, 1988; Rafaeli & Sudweeks, 1997).

In turn, imagination is mediated by users' perception of interactivity (Steuer, 1992), which leads to increased imagery levels. Also, imagery impacts positively on perceived playfulness (Rodríguez-Ardura & Meseguer-Artola, 2018). Finally, changes in users' behavioural patterns during interactive experiences leads to value co-creation: co-creation is generated by a customer that interacts with other customers in engagement platforms.

Furthermore, due to open innovation, technological advances allow customers to participate more actively (Kapoor *et al.*, 2021; Randhawa *et al.*, 2016). Businesses and brands have empowered users to co-create value during the consumption of digital services, increasing the impact of customer behaviour in the process of value co-creation (Kaartemo & Nyström, 2021). As a result, marketing value is generated by the customer who interacts with other customers in engagement platforms (Vargo & Lusch, 2008c), such as the hedonic SNS of Instagram. An example of marketing value in interactive marketing is provided whenever the customer's active participation is required for marketing data to be valuable, since: *'the essence of interactive marketing is the use of information from the customer rather than about the customer'* (Day, 1998:47).

We consider engagement platforms – or service, or interactive, or co-creation platforms (Rubio, Villaseñor, & Yague, 2019) – not only as a combination of several touch-points, but a combination of tangible operand resources (measured in the construct of actual interactivity) that function as

multifaceted mediators to integrate personal non-tangible operant resources[11] (measured in the construct of perceived interactivity) during interactions with other users (Gawer, 2014).

2.1.3. SNSs as engagement platforms

The extraordinary development of SNSs has altered the way users communicate and interact. Deighton & Kornfeld (2007:2) characterised SNSs as a: *'digital interactive transformation in marketing'*. SNSs, such as Instagram, are part of the marketing communication channels, or *'new traffic lanes'*, designed for the convenience of marketers and the benefit of customers. However, despite the deep-rooted involvement of SNSs in marketing communications, there is not enough empirical research on this social phenomenon.

Engagement platforms – exemplified by hedonic SNSs (Roncha & Radclyffe-Thomas, 2016) like Instagram – evolved rapidly in the 21st century into interactive and service platforms due to increased levels of interactivity during value co-creation experiences. There are social and psychological factors that facilitate this rapid evolution (Naseer *et al*., 2021). An example of social factors is the value of the network of contacts (Benkler, 2007; Castells, 2011; Dijk, 2012); an example of psychological factors is perceived interactivity during user participation (Rodríguez-Ardura & Meseguer, 2014). The behaviour of customers that results in the joint creation of value is defined as the construct of customer value co-creation behaviour.

New digital technologies and social media advances imply that resources[12] that were once considered operand are now transformed into operant (Akaka & Vargo, 2014). This focal context facilitates the integration of operant resources through value co-creation efforts (Caridà, Edvardsson, & Colurcio, 2019). Since each context is unique, so it is the contextual value (depending on other resources) that is reflected in the institutional arrangements – by the rules of which resources are embedded in a service ecosystem (Koskela-Huotari & Vargo, 2016) – that facilitate customer value co-creation behaviour (Vargo *et al.*, 2016).

Institutional logics – which embodies the service-dominant logic of a particular service ecosystem (Jaakkola, Aarikka-Stenroos, & Ritala, 2019) – are rules, norms and beliefs that help to make predictable and meaningful service exchanges amongst actors in service ecosystems, such as voluntary behaviour (Encinas-Orozco & Cavazos-Arroyo, 2016) and freedom of choice (Bettencourt & Brown, 1997) and they imply acts of cooperation, help and kindness.

2.1.4. Value generation in hedonic SNSs

We support the idea that value is created beyond the limits of firms and organisations and increasingly more by users of hedonic SNSs that interact in complex virtual environments (Akaka,

[11] We differentiate between operand and operant resources (Constantin & Lusch, 1994). Operand resources are resources to work, perform or act on that affect customers. Operant resources work on operand resources or other operant resources. Operand resources tend to be physical resources (for example, raw materials), whereas operant resources used to be human resources (skills, knowledge and relationships) (Hunt & Madhavaram, 2004). Resources are embedded in service ecosystems.

[12] Mobile applications facilitate co-innovation to customers who use both the website and the application at any time and in any place (Rubio *et al.*, 2019). However, regardless of the growing importance of SNSs and mobile applications as strategic marketing tools for companies and organisations, few investigations have empirically addressed customer value co-creation behaviour in the focal context of digital technologies and social media (Ercsey, 2016). For example, value co-creation has a positive effect on customers' satisfaction, loyalty and word-of-mouth (WOM) in the retail banking (service) sector (Cambra-Fierro, Pérez, & Grott, 2017).

Vargo, & Lusch, 2012). Co-creation is linked to either: (1) a complex process that aims at the transformation of society; or (2) to a superficial development process that justifies the existence of corporations (Nahi, 2016).

We also support the idea that value in hedonic SNSs is, in essence, co-created amongst connected customers. In order to generate new responses to social and technical dilemmas, companies must go beyond the limits of their organisations and reach networks of users that collaborate with other users (Koskela-Huotari *et al.*, 2016; Reypens *et al.*, 2016). Collaborative networks can generate new innovative solutions.

Our view on the functioning of collaborative networks of customers is based on a mechanism-based perspective (Li, Juric, & Brodie, 2017). A growing number of social scientists are increasingly interested in mechanism-based explanations (Glennan & Illari, 2017). These reveal the structure of the process leading to a phenomenon (Hédoin, 2013). This line of thought considers that value is explicated phenomenologically by the mechanisms that lead to its creation.

2.1.5. How social mechanisms generate value through micro-foundations

A number of scholars have argued that value co-creation is a process[13] that is rooted in the actions and interaction of individuals with the context to which they are exposed (Alexander, Evanschitzky, & Murray, 2012; Leclercq, Hammedi, & Poncin, 2016; Majboub, 2014; Payne *et al.*, 2008; Ranjan & Read, 2014; Vargo & Lusch, 2011).

The micro-foundation methodology focuses on the empirical relation between value co-creation and the social interaction amongst users of hedonic SNSs, such as Instagram (Felin & Foss, 2005; Felin *et al.*, 2012; Foss, 2016):

a) This methodology provides a substitute for the macro-macro explanation by exploring the mechanisms that work in the multi-level theoretical approach to a service ecosystem exemplified in the Coleman bathtub for social interaction. An example of social interaction is the social mechanisms involved in the resource integration process (Storbacka & Nenonen, 2011).

b) The idea of the relative autonomy of a service ecosystem within the service-dominant logic, implies that a service ecosystem can be embedded within (or be a subsystem of) a more extensive system (Laud & Karpen, 2017). Thus, service ecosystems have several subsystems that interact with each other: each subsystem contains a different level of analysis, such as the micro-level (actor's interactivity and his or her resources) and the macro-level (a service ecosystem and its associated institutional logics and institutional arrangements).

c) In a few words, the micro-foundation methodology offers a multi-level theoretical approach to answer the type of questions that focuses on social interaction. The micro-foundation methodology can help us study macro-micro-macro-level interactions exemplified in the Coleman bathtub (1990).

[13] We refer to a *'process'* as the explanation for a relationship (Van De Ven & Poole, 2005:8). This is in accordance with the (social) mechanism-based explanation (Hédoin, 2013), although other definitions of process exist, such as how an event evolves and changes over a period of time (Tsoukas & Chia, 2002).

We adopt the conception of service, under the service-dominant logic, as the basic purpose of economic exchange. This concept is defined as the use of personal resources together with other users in networks, (instead of firm-customer dyads), for the benefit of other stakeholders during the exchange of services (instead of goods). This process implies the generation of value-in-use (Rubio *et al.*, 2019) and value-in-context (Vargo & Lusch, 2008a).

We study the process of user interactivity that elicits customer value co-creation behaviour through the lenses of social mechanisms (Coleman, 1990). Our conception of social mechanisms is based on McClennan's (1961) view, which in turn can be traced back to Weber's (1930). The use of explanations-based mechanisms on the relationships between macro- and micro-levels involved in value co-creation reveals the role of customer*s* in virtual environments (Basar, Erciş, & Ünal, 2018).

As more customers interact to create a network (micro-level phenomena), then customer value co-creation behaviour increases in Instagram (macro-level phenomena). Notwithstanding, in behavioural economics, the relation between macro- and micro-levels of phenomena is a special general correlation, rather than a cause-and-effect relationship (Hédoin, 2013).

In brief, we propose a new way to study the effects of greater social interaction using Coleman's bathtub (Storbacka & Nenonen, 2011).

2.1.6. Micro-perspective of interactivity in hedonic SNSs

Since the beginning of the 21st century, globalisation has accelerated digital communication on social media, allowing customers to interact with other customers more frequently if customers are motivated by positive interaction experiences. Under the service-dominant logic, perceived interactivity elicits unplanned and voluntary usage and decision-making (Johnson, Bruner II, & Kumar, 2006) during value co-creation (Kleinaltenkamp *et al.*, 2012). Thus, new value is created if engagement amongst customers is facilitated (Li *et al.*, 2017).

The challenge for marketing scholars is that they need to learn how customers operate within the virtual environment since it differs from the physical environment in terms of: (1) the loci of interactivity; (2) power relations; and (3) new possibilities for the creation of value (Claffey & Brady, 2014). For example, it is necessary to comprehend how perceived interactivity and feelings of co-creation relate to each other (Lee & Chang, 2011; France, Merrilees, & Miller, 2015) and how they impact the creation of positive attitudes towards the brand and the brand's digital content (Xie, Wu, Xiao, & Hu, 2016). Extant literature on the service-dominant logic has linked interactivity to the creation of users' positive attitudes towards the brand and the brand's digital content (Domegan, Collins, Stead, McHugh, & Hughes, 2013).

Perceived interactivity influences purchasing attitudes and purchase decisions because ease of use affects positive attitudes towards the brand's digital content, which triggers its future use (Chu & Yuan, 2013). Furthermore, perceived interactivity involves the use of *'psychic energy'* (Belk, 1988:144) and work, that leads to an amplified feeling of achievement (Ladik, Carrillat, & Tadajewski, 2015; Sheth & Solomon, 2014), which in turn is transferred into psychological stimulus and increased levels of advocacy (Urban, 2005).

Under the service-dominant logic, the study of the link between value co-creation and interactivity in engagement platforms requires a micro-perspective of the role of an actor interacting with other

actors, and how it complements and mediates in the macro-perspective of customer value co-creation behaviour (Merz, Zarantonello, & Grappi, 2018). Our micro-perspective is innovative in the use of the Coleman (1990) bathtub:

- To study the multi-level nature of the experience of customer value co-creation behaviour in complex networked services (Vargo, 2011).
- To analyse the service ecosystem at the micro-level of user-to-user interactions amongst actors. The individual actor is a key factor contributing to a service ecosystem under the service-dominant logic perspective (Tronvoll, 2017).
- The patterns of resource integration of operant resources at the individual actor level are considered an antecedent of value co-creation (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016).

By focusing on the basic principles of customer value co-creation behaviour at the micro-level of user-to-user interactions (Nenonen & Storbacka, 2009), we aim to gain insight into an individual actor's roles. We will be then able to provide innovative ideas for the progress of a broader macro-level perspective of value co-creation in the *'joint customer and company sphere'*, i.e. the emerging concept of the market (Alves, Fernandes, & Raposo, 2016:1629) (see Figure 5 in section 2.7.2).

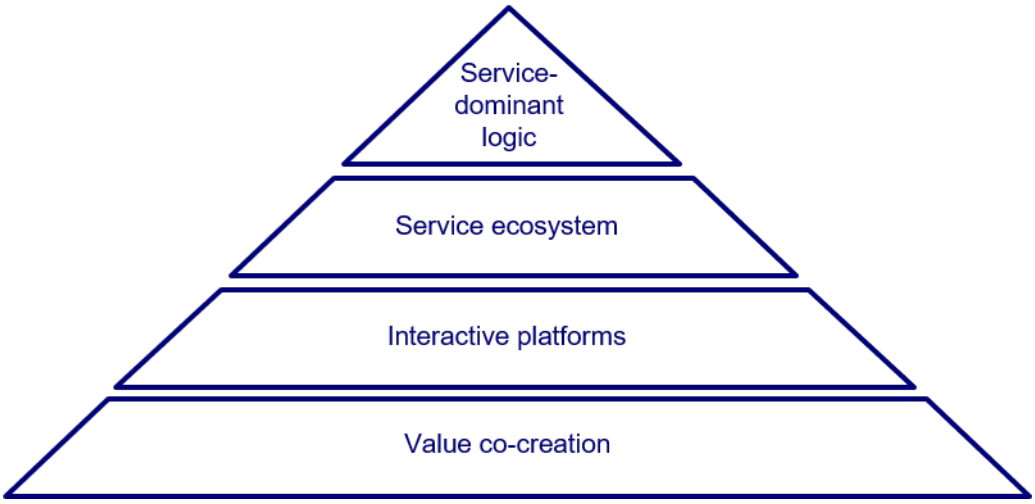
2.2. A service-dominant logic theoretical framework

We first develop a theoretical framework to study actors' interactivity in hedonic SNSs, like Instagram. Here, the notion of interactivity functions as a micro-foundation for customer value co-creation behaviour under the service-dominant logic.

Service-dominant logic enables a micro-level view (Felin & Foss, 2005) or micro-perspective of the notion of the interaction amongst individual actors that generate an *'interactive process of resource integration'* (Storbacka ***et al***., 2016:3009). In contrast, value co-creation is seen as a macro-level concept in strategic management and organisational literature

The theoretical framework is formed by the strategic management concepts and organisational levels to study hedonic SNSs, such as Instagram: service-dominant logic, service ecosystem, interactive platforms, and value co-creation (see Diagram 2).

Diagram 2. Service-dominant logic theoretical framework



Under the service-dominant logic, the purpose of hedonic SNSs is to provide an optimal customer experience and to help generate as much value co-creation as the customer him or herself (Stevens & Boucher, 2016). This view is opposed to the service-logic that establishes that value is only generated when organisations are involved with users and engage customers in dyadic firm-customer relations (Ramaswamy & Ozcan, 2018).

Although the concepts of user interactivity and customer value co-creation behaviour operate at different levels of analysis, both are fundamental for our service-dominant logic research of the value generated by users of hedonic SNSs. Each concept has different meanings depending on the research stream that we follow: service-dominant logic, service-logic or goods-dominant logic. For this reason, we compare the research streams of the service-dominant logic and service-logic in the remaining of this section. For example, under the service-dominant logic, customers jointly co-create and define value (Vargo & Lusch, 2004; Vargo & Lusch, 2008c) and value is created during the integration of customers' resources that requires the interaction amongst actors (McColl-Kennedy, Vargo, Dagger, Sweeney, & van Kasteren, 2012).

We follow Tommasetti, Troisi, & Vesci (2015) in their description of the service-dominant logic. They refute the service-logic theory of Grönroos & Voima (2013) in aspects such as the definition of customer value co-creation behaviour and the effect of interactivity in value co-creation. Therefore, we must first clarify the conceptualisation, operationalisation, and the dimensions of customer value co-creation behaviour and interactivity under the service-dominant logic. Three arguments justify our claim, as described in sections 2.2.1, 2.2.2, and 2.2.3, which contribute to the research stream of the service-dominant logic in the study of value co-creation.

Notwithstanding, Grönroos (2009) believed that there are commonalities between the service-logic and the service-dominant logic theories. These commonalities include the level of involvement of customers in the process of co-creation during customer participation (Hollebeek, Glynn, & Brodie, 2014).

2.2.1. Differences between the service-dominant logic and the service-logic in value co-creation

Understanding the role that customers play in value co-creation can be based on two different schools of thought. On the one hand, the service-dominant logic perspective defends that *'the customer is always a co-creator of value'* (Vargo & Lusch, 2008b:148). On the other hand, the service-logic postulates that *'customers (…) are not always value co-creators'* (Grönroos, 2011:294).

Service-dominant logic and service logic theories also differ in the number of interactions amongst the main stakeholders required to conceptualise and operationalise interactivity. For example, under the service-logic standpoint, the customer and the firm (or brand) must first interact in a shared environment. Under this logic, if there is no interaction or dialogue between the customer and the business, value co-creation is not possible.

In addition to this, the concept of value co-creation presents significant new aspects from the service-dominant logic perspective. However, it has not been given sufficient attention in the literature of customer behaviour (Vargo & Lusch, 2004, 2008a, 2008b, 2017; Vargo, Wieland, & Akaka, 2015), especially in hedonic SNSs, like Instagram.

The service-logic (Grönroos, 2012) considers co-creation from the firm's perspective and refers to interaction as one moment of consumption between the customer and the company (Tommasetti, Troisi, & Vesci, 2015). By contrast, the service-dominant logic considers co-creation from the customer's perspective and affirms multiple interactions amongst individual actors during service encounters that generate value-in-use (Rubio *et al.*, 2019) and value-in-context. Therefore, there is a single combined interaction involving the customer and the firm under the service-logic (Grönroos, 2009), whereas there are multiple customer-to-customer interactions under the service-dominant logic (Lusch & Vargo, 2006; Nambisan & Baron, 2009; Tanev, Thomsen, & Ma, 2010).

Following this fundamental distinction, under the service-logic, interaction occurs between firms (or brands) organisations and customers (Grönroos, 2009); in fact, interaction happens only between the firm and the individual customer (Ramaswamy, 2009) in a single process of unified interaction (as perceived by the customer) during the consumption of services. However, under the service-dominant logic, many interactions occur amongst multiple actors (Lusch & Vargo, 2006; Cova & Salle, 2008); this means that there is a network of interactions – defined as network interactivity in our research.

Likewise, the emergence of engagement platforms in the public sphere could be seen as a means to create information networks of citizens for the provision of services. Tommasetti *et al.* (2015) argued that each customer is linked to a social network from which he or she receives help to cope with the provision of a service under the service-dominant logic. Customers receive help to integrate resources from personal means (i.e. colleagues, friends and relatives), businesses and public sources (Vargo & Lusch, 2011).

Under the service-dominant logic, extant literature of value co-creation focuses on: (1) actors' operant resources such as skills, knowledge and relationships used during the process of resource integration; and (2) the interface (constituted by touch-points) for the integration of operant resources during the process of value co-creation. We identify which interfaces, such as touch-points in the form of engagement platforms, facilitate the integrations of actors' operant resources

during interaction amongst networked actors. We define interactive platforms[14] under the service-dominant logic as the combination of interfaces, touch-points and engagement platforms (Callon, 2016; Drummond, McGrath, & O'Toole, 2018; To *et al.*, 2018).

2.2.2. Differences between the service-dominant logic and the service-logic in interactivity

We argue that the concept of interactivity that elicits customer value co-creation behaviour differs between the service-dominant logic and the service-logic perspectives; this view is supported by extant research on interactivity in web-based communities (Rafaeli, 1988; Rafaeli & Sudweeks, 1997) under the service-dominant logic perspective.

According to Grönroos (2009), differences in the conceptualisation of interaction between service-dominant logic and service-logic theories are:

- Interaction in the service-dominant logic considers that customers participate in value creation and considers that the environment's design affects this process (Carlson, Rahman, Voola, & De Vries, 2018). Value is jointly created by customers that interact online with other customers through value-creating practices. Social protocols operate on user's resources during his or her practices: (1) through rules and tools; (2) on resources such as skills, knowledge and relationships; and (3) with emotional decisions (Schau, Muñiz, & Arnould, 2009). Customers participate in interactive platforms as active members in implementing personalised goods, services and experiences (Etgar, 2008; Payne, Storbacka, & Frow, 2008; Prahalad & Ramaswamy, 2004). By contrast, under the service-dominant logic, the business is limited to offering value propositions to customers as the customer primarily influences other customers' value creation process (Grönroos, 2009).

- Interaction in the service-logic theory is conceptualised as the action between two entities or parties, each affected by the relationship in the business context of the supplier-customer relation. Interaction is a unified process between the bussiness or firm and the individual customer (Grönroos, 2009). Under the service-logic, the business is not limited to offering value propositions to customers, but it primarily influences customers' value creation process (Grönroos, 2009).

Under the service-dominant logic, interactivity has been linked to well-being (McColl-Kennedy, Hogan, Witell, & Snyder, 2017) since social interaction leads to social influence and thus to an increase in social capital (McKenzie & Harpham, 2006). This line of thought considers that, to co-create and generate value in online groups, users who interact with other users must collect personal operant resources of skill, knowledge and relationships.

Therefore, the grouping quality of networks is reflected in the social attributes of interactivity, when interactivity is defined as a continuum[15] beyond the technical attributes of engagement platforms.

[14] Interactive platforms are more than the collection of several touch-points (Breidbach *et al.*, 2014). They considered that an interactive platform has multiple facets that facilitate and empower the actor to interact with other actors whose intention is value co-creation. Interactive platforms connect the activities and processes of users across different digital and physical environments (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016). Interactive platforms differentiate between *'intermediaries'* and *'mediators'*; *'intermediaries'* empower other actors (to a certain extent) devoid of *'transformation'* – since they are not involved in resource integration – while *'mediators'* are actors that magnify the differences between the outputs and the inputs, since the inputs seek to maximise resource integration (Latour, 2005:37).

The grouping quality of networks during interactions with online communities is foundational for value co-creation under the service-dominant logic. This network approach supports the relation between resource integration and value co-creation; networks facilitate the process of value co-creation through the interaction amongst networked actors that integrate resources that translate into new value (Fyrberg *et al.*, 2009).

A review of extant literature on user's interactions during value co-creation under the service-dominant logic shows how online users' need-for-cognition (knowledge) and skills are antecedents of perceived interactivity, since these *can impact users' intention to explore this technology'* (Claffey & Brady, 2014:325). Along this line of thought, Murschetz (2011) supported the need to generate a conceptual model of customer behaviour with testable hypotheses that differentiate between the perceptual, technological and communicative aspects of interactivity.

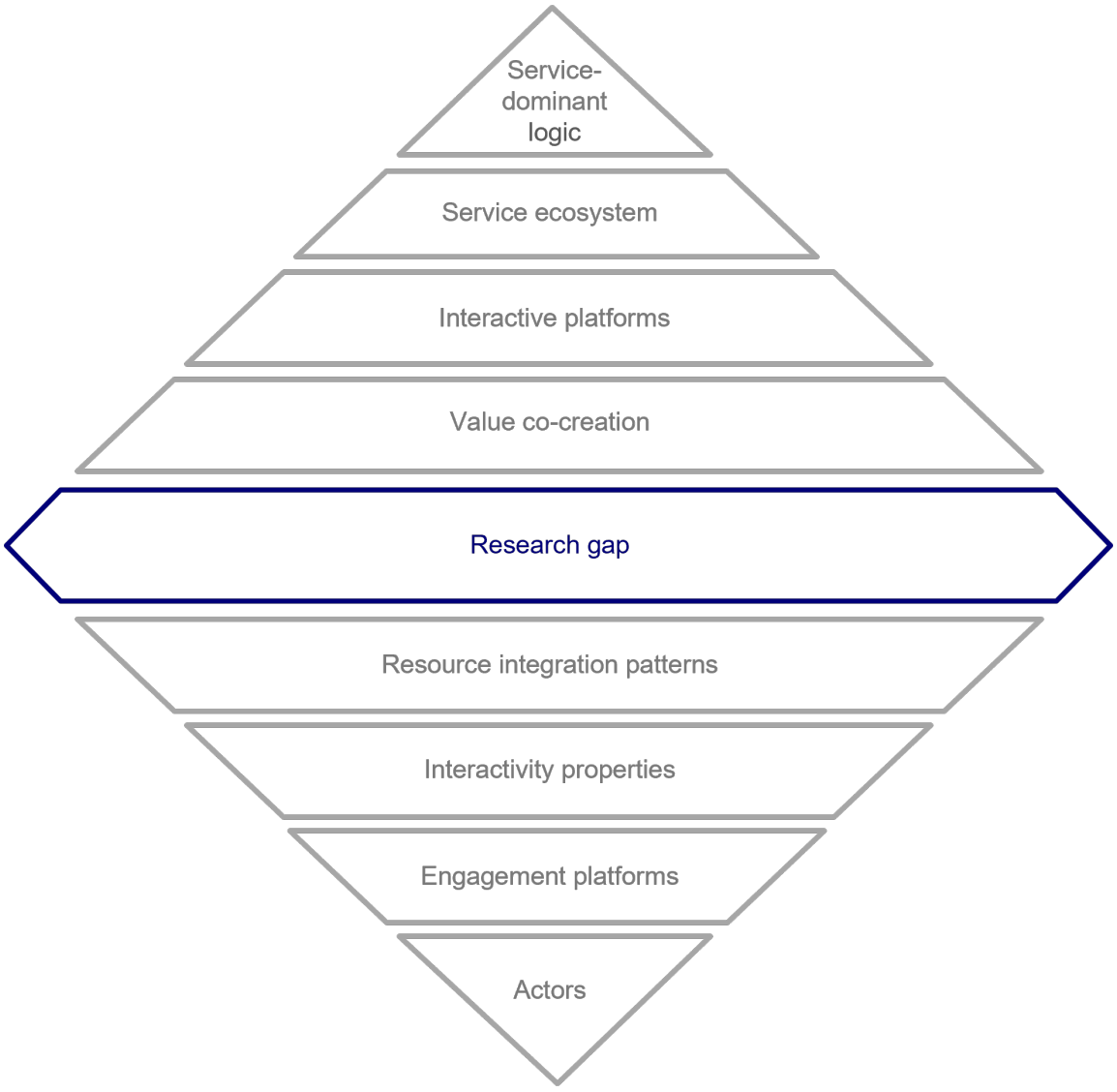
However, we critically discuss and refute the technologically-oriented models of expected and actual interactivity (Broekhuizen & Hoffmann, 2012; Zhao & Lu, 2012) under the service-logic perspective. An extensive literature review supports our view on perceived interactivity, which is not limited to hedonic SNSs, but can be applied to any service ecosystem under the service-dominant logic (Vargo & Lusch, 2017). Under the human-computer interaction paradigm, perceived interactivity is grounded on the perception of the individual user's interaction online (Steuer, 1992) and with other digital technologies and media.

Unlike expected or actual interactivity, perceived interactivity is responsible for integrating users' operant resources in a specific virtual environment or software application, which generates a positive or negative perception of the experience with the product, content or device. Also, customers who support positive interaction experiences with other users are motivated to co-create value, facilitate relational values and create value for other users (Claffey & Brady, 2014). Relational values can help to assess how *'people articulate the importance of ecosystem services in their specific, socio-culturally embedded language of valuation'* (Himes & Muraca, 2018:13).

Under the service-dominant logic, we identify a gap in extant literature of interactivity, based on: (1) the insufficient number of papers that study interactivity and value co-creation; (2) the diversity of definitions of interactivity, which overlap and have non-comparable units and levels of micro and macro-analysis; and (3) the different effects of perceived interactivity on customer participation behaviour, such as resource integration. We aim to close this gap in interactivity, particularly in the relationship between (1) the social factors affecting users who interact with other users during network interactivity (Zhao & Lu, 2012); and (2) the psychological mechanisms of perceived interactivity when individual users engage in resource integration practices (Liu, 2003; Liu & Shrum, 2002) of value co-creation (see Diagram 3).

[15] Jensen (1999) divided the existing definitions of interactivity into three categories: prototypic, criteria and continuum. (1) Interactivity is described as *prototypic* examples (Durlak, 1987) in interactive media systems, such as telephone, audio conferencing systems, computers, emails, and exchange of photographs, line drawings and data; (2) interactivity is defined as *criteria*; this is, as an added feature or characteristic in a technological or cognitive artefact (Dastani & Sirjani, 2015), or media, that has to be satisfied (Miller, 1988); (3) interactivity is defined as a *continuum* (Rafaeli, 1988; Steuer, 1992), this is a quality that is modulated to a higher or lower degree, or an n-dimensional concept. We use in our research the continuum between the social (behavioural) and the psychological (cognitive) since the other two definitions (prototypic and criteria) are bounded to the structural/mechanistic perspective of expected interactivity.

Diagram 3. Research gap between resource integration patterns and value-cocreation under the service-dominant logic



2.2.3. Differences between the service-dominant logic and the service-logic in the link between value co-creation and interactivity

We adopt the service-dominant logic theory to address the unplanned and voluntary customer-to-customer interaction in engagement platforms in the context of a *'networked market'* (Nenonen & Storbacka, 2010:9). Engagement platforms, which resources are embedded in service ecosystems, aim to provide an optimal customer experience and enable value co-creation (Stevens & Boucher, 2016).

Some studies note the insufficient number of studies on the nature and the outcome of value co-creation generated at the micro-level of individual perceived interactivity (Vega-Vazquez, Revilla-Camacho, & Cossío-Silva, 2013; Peters & Presey, 2009). Lusch & Vargo (2006a) argued that

more research is needed on the connection between resource integration and network interactivity in the form of value configurations of actors. The actors' value configurations are social and economic actors interacting and exchanging resources through networks (see Figure 2). Institutional logics and institutional arrangements facilitate the value configuration of actors that operate through social mechanisms.

Vargo and his colleagues (Vargo & Lusch, 2004, 2008a, 2008b, 2017; Vargo, Wieland, & Akaka, 2015) called for a: (1) *'measurement framework of customer value co-creation practices during the service process'*; (2) with an *'implicit hierarchical structure based on (…) activities'* (Tommasetti ***et al.***, 2017:930), labelled social mechanisms, that leads to several levels of analysis to guarantee sufficient semantic coverage of customer value co-creation behaviour; and (3) for the study of customer value co-creation behaviour at several levels of analysis. However, the specific social mechanisms that lead to the integration of customers' operant resources[16] are still unidentified in the literature, and it remains a difficult task for academic research outside the framework of analysis of the service-dominant logic.

Researchers who follow the customer perspective, under the service-dominant logic, argued that the SNS must be relevant and useful to the customer for a conceptual model to work. Then, interactivity might not automatically generate value. Instead, value co-creation will only occur unless the virtual environment is relevant and valuable for the customer, triggering cognitive and affective connections amongst networked users (Mollen & Wilson, 2010).

Therefore, if the relevance of the SNS leads to increased advocacy levels, then actors interact with other actors to co-create value during resource integration of operant resources – such as skills and knowledge – in service-for-service exchanges amongst customers that result in the creation of value-in-context (Laud & Karpen, 2017).

Furthermore, we suggest that instagrammers can create and benefit from the quantifiable social value of value-in-context (Löbler & Hahn, 2013). The social mechanisms (Coleman, 1994) that create value-in-context operate through the increased psychological ownership that results from the perceived interactivity. In turn, instagrammers can transform the social value into economic value through value propositions to other users.

2.3. Structuration theory

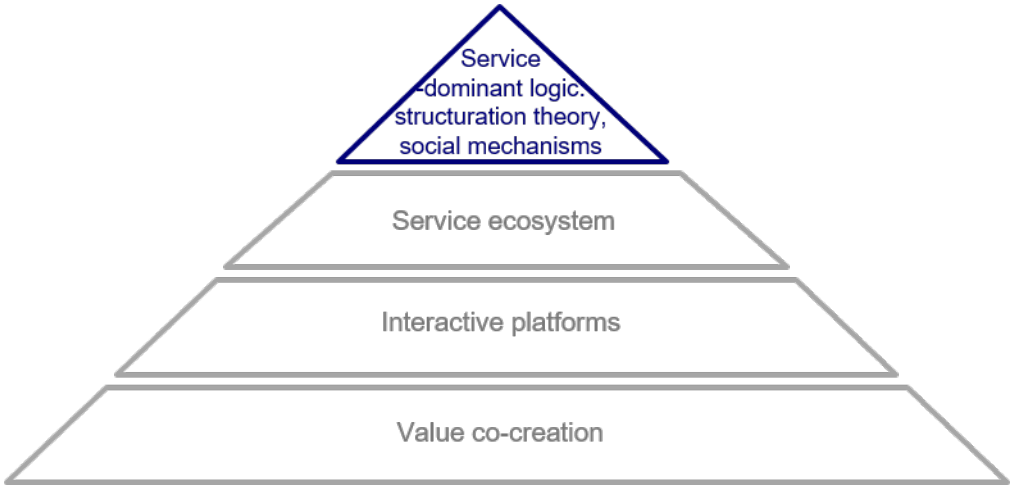
Structuration theory (Giddens, 1984) describes the origins and the reproduction of social relations and practices – such as the integration of actor's operant resources during value co-creation activities (Laud ***et al.***, 2015) – as the interplay between the social structure and the agency of actors. The social structure and the agency of actors are the components that form the social system; neither the social structure nor the agency of actors in isolation has priority over the other factor (Harmon, Haack, & Roulet, 2018). While the social structure allows for social interaction, actors' interactivity with other actors essentially produces and reproduces these structures.

[16] Under service-logic, it is unclear what type of resources are needed and what interfaces actors use to interact with other actors during value co-creation (Nenonen & Storbacka, 2010). Studies that link value co-creation and interactivity in SNSs, largely assumed the perspective of the company. These studies lack a clear identification of the type of operant resources (such as skill, knowledge and relationships) and the interfaces actors use to interact with other actors in the process of resource integration (Singaraju ***et al.***, 2016).

The social structure refers to rules and resources, whose structuring properties mix time and space to produce a specific social system. The individual agency[17] represents the capacity of the self-reflecting actors to interact with other actors using the ability of choice (Archer, 2000). Therefore, the central proposition of structuration theory (Giddens, 1984) is that actors co-create and re-create long-lived institutional arrangements that provide rules for interaction, but these also delimit interaction. Our research considers the related notions of human agency and computer agency and whether digital media can act as resource integrators: *'and can forge relationships between other things embedded with knowledge capabilities'* (Haase & Kleinaltenkamp, 2011:148).

Accordingly, we integrate the structuration theory, and the social mechanisms that link the structure and the agency of actors, using a holistic understanding of customer value co-creation behaviour, which consists of the following components: (a) service-dominant logic, (b) service ecosystems; (c) integration of resources; and (d) value co-creation (see Diagram 4).

Diagram 4. Service-dominant logic



Structuration is a theory of the socially constructed and reproduced systems, whereby both micro- and macro-levels of analysis are required to study the social mechanisms (Lotrecchiano, 2011) that lead to resource integration of customer's operant resources. Structuration is a meta concept that refers to the structure as both the result of human interaction and the context enabling human interaction (Giddens, 1984). In our study, the process of structuration involves the following mechanisms to ensure that integration of customers' resources is achieved:

— the mutual interaction of individual actors and networks with organisational elements; and

— the qualified individual action and subsequent restrictions that are embedded within organisations (Laud *et al.*, 2015).

The structure of an organisation is the result of previous individual actions. Therefore, neither the macro-level nor the micro-level analyses in isolation are sufficient, but the combined analysis is

[17] Scholars adopted agency not only for humans, but also for technology that is capable of acting, albeit of a different nature (Cecez-Kecmanovic, Galliers, Henfridsson, Newell, & Vidgen, 2014). For example, Leonardi (2012:42) defined human agency as *'coordinated human intentionality'*, whereas he defined material agency as: *'ways in which a technology's materiality acts (…) material agency is activated as human beings approach technology with particular intentions'* (Leonardi, 2012:42).

required to study social systems using social mechanisms (Blocker & Barrios, 2015). Value co-creation is a macro-level construct, and interactivity is a micro-level construct, and none of them individually are sufficient to explain the social mechanisms that lead to the integration of operant resources. This is why we require a combined study of value co-creation and interactivity through macro-micro-macro links.

For example, actors use operant resources to integrate their operand resources during value co-creation (Kleinaltenkamp *et al*., 2012). Since this is a macro-level theory, resource-integration practices that lead to value co-creation are seen in the social context where these resources are embedded, although this process is facilitated at the micro-level by the actor's agency (Archer, 2000).

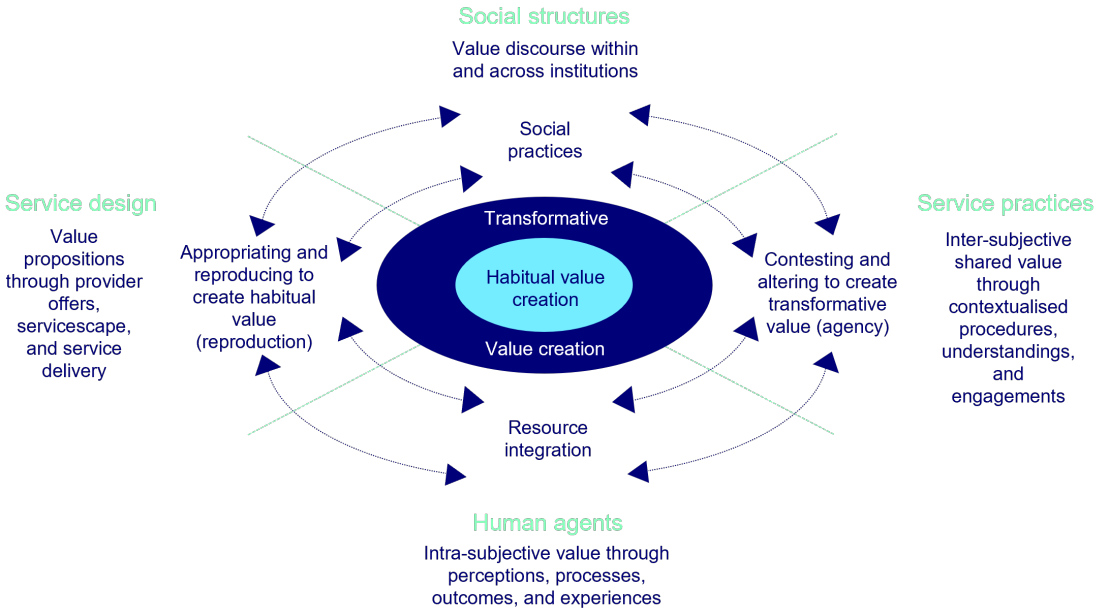
In other words, actors imbued with agency interact with operant resources to act upon operand resources – as combined operant and operand resources constitute interactive platforms, leading to value co-creation (Kleinaltenkamp *et al*., 2012). This raises the question of whether humans possess the ability of agency – the faculty of actors to act with choice at the micro-level; and, whether actors can be self-reflexive, that is to interact with self-knowledge and free will with other actors (Archer, 2000). In turn, this leads to consider whether digital technology and media can act as resource integrators alongside humans (Haase & Kleinaltenkamp, 2011) to constitute engagement platforms.

2.3.1. Value configuration space and social mechanisms of value co-creation

In order to explain the origins of habitual value creation (interaction or summative) and transformative value creation (emergence), we focus on the concept of value configuration space (Blocker & Barrios, 2015) that is derived from a comprehensive view of value creation. This vision incorporates actors, communities, service providers and social structures (Chandler & Vargo, 2011; Edvardsson, Skålén, & Tronvoll, 2012; Grönroos & Voima, 2013).

Value co-creation takes place on a broader value configuration space because all service actors are also social actors. In Figure 2, the continuous ellipses of habitual and transformative value creation illustrate that value co-creation takes place in a service system that in turn is embedded in a broader social system (social practices and resource integration), which is part of a more comprehensive social structure (social structures and human agents). The continuous lines indicate that the process is observable and the dotted lines indicate that the processes are unobservable (see Figure 2).

Figure 2. Theoretical value configuration space



Source: Blocker & Barrios (2015:3).

Based on the value configuration space, the theoretical explanation for the social mechanisms involved in resource integration under the service-dominant logic (Kleinaltenkamp *et al.*, 2012) establishes that resource integrators are customers imbued with agency. This is the self-reflexive capacity of individual actors and organisations to act with choice to use operant resources on operand resources (see Figure 2, with habitual value on the left- and transformative value on the right-hand side of the figure).

The key to understanding social mechanisms is to study the practices of resource integration within the social context in which they take place (Kleinaltenkamp *et al.*, 2012). These are the social structures that facilitate resource integration practices during interaction amongst customers. This considers that social interactions are *choreographed* (Ballantyne & Varey, 2006; Fyrberg & Juriado, 2009) between key actors and specific resources during the process of resource integration, by way of which: *'things, persons, machines, money, institutions or concepts'* (Peters *et al.*, 2014:8) achieve the status of resources. Also, social interactions are *choreographed* during resource integration practices, as: *'choreography tracks the message sequences between parties and sources'* (Peltz, 2003:46).

The choreography of resource integration patterns leads to the joint creation of value by actors. Interactive platforms connect user activities and processes in different digital and physical environments. Understanding the spatial and temporal conditions of the resource integration patterns allows designing the value generation aspects of interactive platforms (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016).

Therefore, the choreography of social interactions during resource integration practices that lead to value co-creation are studied: at the macro level, in the social context of service ecosystems in which the resources are embedded and integrated (Laud & Karpen, 2017); and at the micro-level, in the frame of reference of human agency (Archer, 2000) during interaction amongst users.

2.4. Integrative approach to customer value co-creation behaviour

We adopt an integrative or holistic approach in the study of value co-creation amongst instagrammers as we collect and integrate concepts, theories and contributions from several different fields:

- A model-driven approach to service ecosystems. The service-dominant logic narrative evolves into a service ecosystem perspective whereby value co-creation is a systemic concept (Vargo & Lusch, 2017). By systemic, we mean relating to or affecting the whole of the service ecosystem, instead of just some parts of it. See section 2.5.

- Resource integration of customers' operant resources embedded in a service ecosystem (Edvardsson *et al.*, 2014). Resource integration takes a central role as a tool for actors to be resource integrators, i.e. who phenomenologically co-create value (Vargo & Lusch, 2004), and therefore is also a systemic concept. See section 2.6.

- The fundamental building block of the service-dominant logic is customer value co-creation behaviour. We study unplanned and voluntary usage of hedonic SNSs that leads to value co-creation (Ercsey, 2016; Yi & Gong, 2013, 2011). See section 2.7.

- We also take into consideration literature in interactivity within communications studies (see section 2.8), rational choice theory and the prisoner's dilemma and the theory of planned behaviour (Ajzen, 2020) (see section 2.9).

2.5. Service ecosystems

Under a service-dominant logic, a system of services (or a service system) is phenomenologically defined by the value that results from the interaction amongst actors (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016). Service systems *'survive, adapt, and evolve through exchange and application of resources – particularly knowledge and skills – with other systems'* (Vargo & Lusch, 2008c:146). Service systems that are considered sustainable over time are known as service ecosystems. The study of service ecosystems facilitates the study of the integration of resources, value co-creation, and the improvement of service ecosystems (Vargo & Akaka, 2012). It also offers key learnings lessons that facilitate innovation in service provision.

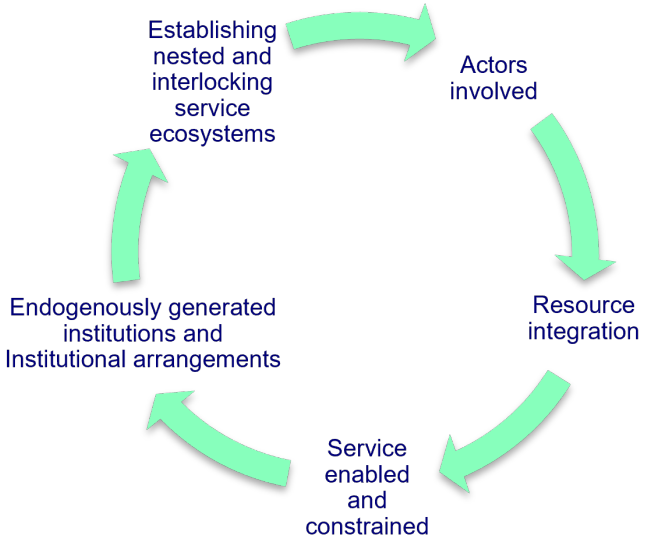
In recent years, the narrative of value co-creation has become one in which customers provide reciprocal services, as they convert into resource integrators that create value through holistic experiences imbued with meaning *'in nested service ecosystems governed and evaluated through their institutional arrangements'* (Vargo & Lusch, 2016:7). Blaschke, Haki, Aier, & Winter (2018) defined institutional arrangements as core principles (such as rules, norms and beliefs) that regulate the structure and dynamics interactions amongst customers that lead to value co-creation.

Institutional logics determine the dominant logics, which are psychological patterns that drive an actor's cognition within an organisation, and are mediated by collective norms, values and beliefs. Institutional logics are formed by rules, norms and beliefs that help actors make predictable and meaningful service exchanges with other actors and their resources in service ecosystems.

Institutional arrangements are materialisations of institutional logics; they form the structure and are the dynamics of value generation (Vargo & Lusch, 2016; Blaschke, Haki, Aier, & Winter, 2018).

These core principles make service exchange in service ecosystems predictable and meaningful (Blaschke, Haki, Aier, & Winter, 2018). Under the service-dominant logic, a service ecosystem enables the value co-creation process (Vargo & Lusch, 2016). When the five axioms of the service-dominant logic ignite a service ecosystem, the process of value co-creation begins (see Figure 3).

Figure 3. The narrative and processes of service ecosystems under the service-dominant logic



Source: Vargo & Lusch (2016:7).

If social and economic actors exchange services and integrate their operant resources, enabled and restricted by institutions and institutional arrangements, interconnected service ecosystems of value co-creation are created, forming the basis for new value co-creation activities. We introduce a service-dominant logic perspective to the ecosystem of services (Bettencourt, Lusch, & Vargo, 2014a, 2014b) to create a service-dominant logic approach to the study of value creation.

Furthermore, customer value is the key to generate brand value (Tajvidi, Wang, Hajli, & Love, 2017), since value lies in the collective practices resulting from the interaction amongst network customers, rather than in firm-customer dyads (Majboub, 2014). If firms give control to customers, then customer engagement can increase and brand equity due to the added value associated with newly created customers' operant resources. Fernandes & Remelhe (2016) argued that customer engagement is linked to customer co-creation. Co-creation is the process of generating new value at the material and immaterial level between peer customers (Galvagno & Dalli, 2014).

A structural and service component of an ecosystem of services are engagement platforms. Hedonic SNSs such as Instagram function as engagement platforms, and they can be conceived under two different perspectives:

- On the one hand, an engagement platform might combine touch-points and interfaces with the brand for virtual and physical interaction. Breidbach, Brodie, & Hollebeek (2014) studied the environment that facilitates value co-creation during online and offline shopping. They proposed the idea that an engagement platform is made up of the

combination of several touch-points and interfaces for virtual and physical interactions [18] generated by a combination of digital and physical service exchanges (Breidbach, Brodie, & Hollebeek, 2014:594).

- On the other hand, an engagement platform can be understood as the digital component of an interactive platform (Ramaswamy & Ozcan, 2018) that is embedded into a broader ecosystem of services (Laud & Karpen, 2017). Ramaswamy & Ozcan (2018) shifted the approach to interaction, from the interface between the physical and digital to the digital platform itself. Ramaswamy & Ozcan (2018) saw an engagement platform as the digital component of a broader interactive platform that, in turn, is embedded in a broader service ecosystem.

However, we define an engagement platform as neither the combination of several touch-points, nor the digital component of interactive platforms. Instead, we believe that engagement platforms are the tangible and intangibles by-products generated in interactive platforms by users (Blasco-Arcas *et al*., 2020). Therefore, a service-dominant logic-based theoretical framework considers that customers can access hedonic SNSs from different platforms, such as smartphones, laptops and tablets, and use different tools, such as 4G, wireless and cable connections.

We define an interactive platform as the combination of physical operand resources (measured in actual interactivity) and non-physical operant resources such as skills, knowledge and relationships (measured in perceived interactivity) that result in the formation of service platforms. Thus, interactive platforms include not only newly created resources, but also the customer that participate in generating value:

- Resources operate as multifaceted mediators that actors control to interact with other actors to integrate resources (Gawer, 2014). The social and economic value that customers create when users integrate resources and add value to the result (this is value-in-use) can help organisations in the design of engagement platforms (Carlson *et al*., 2018) that are rooted in broader service ecosystems (Breidbach, Brodie, & Hollebeek, 2014).

- Customer participation in interactive platforms provide organisations with technological and human resources that can gain from the engagement of individuals and groups during the joint creation of value. Specifically designed interactive platforms, such as hedonic SNSs, use digital media to promote the active participation of individuals and communities (Kimbell, 2011; Nambisan & Baron, 2009; Sawhney, Verona, & Prandelli, 2005).

Service is considered as the interaction of customers with resources (Edvardsson, Gustafsson, & Roos, 2005). Service is also regarded as the access to resources of all types and, more precisely, as the recombination of resources during customer value co-creation behaviour (Bergholtz, Andersson, & Johannesson, 2010). More important than considering the internal characteristics of services (intra-role) is the understanding of the context of the use and exchange of resources (extra-role) for value co-creation.

[18] Notwithstanding, interactivity have different effects on value co-creation in the physical and virtual environments. For example, people with high levels of anxiety can only enjoy the benefits of online C2C interactions, as opposed to offline (Becker & Pizzutti, 2017).

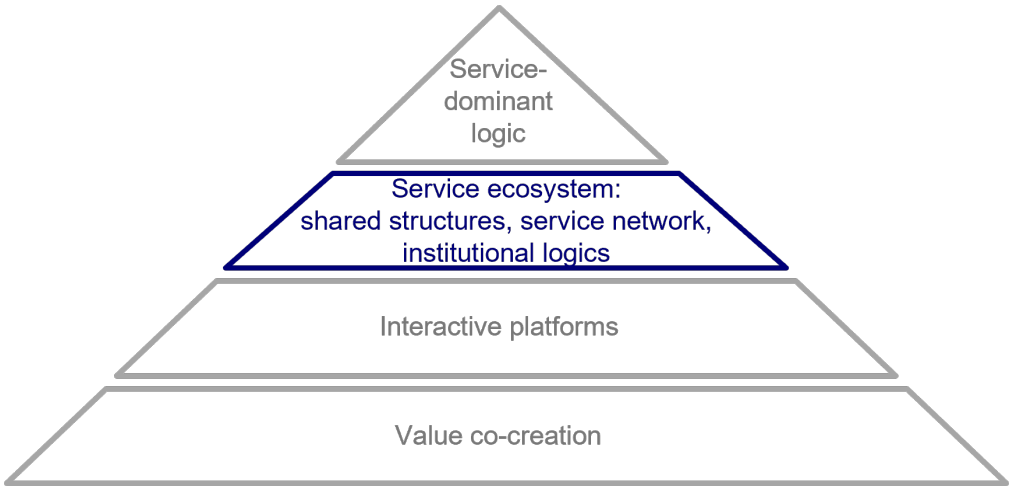
2.5.1. Understanding service ecosystems under the service-dominant logic

A service ecosystem combines different types of service providers, service centres and service entities that are part of a *'hub and spoke constellation'*; some of these elements are owned by the hub, but others are not (Bauler & Pipart, 2013:121). Instead, they are service business process outsourcing (BPO's) expert companies gathered in a seamless combination and willing to meet customers' expectations (Prawesh, Chari, & Agrawal, 2021). This constellation formation or network formation is driven initially by reasons of cost arbitrage and labour arbitrage. Thus, service ecosystems can facilitate a new economic structure for suppliers. In addition, service ecosystems facilitate suppliers to develop excellence in the delivery process and give value to the partners that can provide excellence during service provision.

Some examples of service ecosystems are *'software ecosystems, service-based collaborative networks and web application platforms'* (Ruokolainen, 2013:2). Social media favours the provision of web applications and their mashups on the internet. Typical social media applications are: SNSs and knowledge exchange of services, tools and platforms to create end-user content and online collaboration tools for specific tasks. Hedonic SNSs such as Instagram provide infrastructure services to share knowledge, such as video feeds, users' profiles, personal information, individual competencies, and discussion forums (Ruokolainen, 2013).

A service ecosystem is a self-integrating resource system by relatively autonomous and participating actors connected by shared institutional logic. The creation of mutual value results from exchanging services amongst actors (Vargo & Lusch, 2016) (see Diagram 5).

Diagram 5. Service ecosystem



A service ecosystem focuses on (1) actors, in the roles of service provider and beneficiary, and their relationships; (2) the socio-cultural context in which an actor interacts with other actors; and (3) the shared structures, such as language, meaning, signs, symbols, experiences, rituals, etcetera (Vargo & Lusch, 2016). Service ecosystems emphasize value co-creation through the integration of resources and the shared institutional logic during service exchanges. Shared institutional logic can benefit from the synergetic role of institutional logics in micro-macro levels analysis of service ecosystems (Lusch, Vargo, & Gustafsson, 2016).

We focus on networks of actors, or systems, (Ng *et al.*, 2012) and their relation with larger structures like institutions (Vargo & Akaka, 2012). Coleman's (1990) paradigm is to link the individual actor who follows the normative and the rules of social organisation at the macro-level – explained by the structuration theory (Giddens, 1984) – to the micro-level of rational choice (Favereau, 2005). Maglio & Spohrer (2008:18) advocated for this perspective of service ecosystem, that *'are value-co-creation configurations of people, technology, value propositions connecting internal and external service systems, and shared information (e.g., language, laws, measures, and methods)'*.

For a service network to materialise within a service ecosystem, we rely upon systems theory (Barile & Polese, 2010) and a structuration model of technology that focuses on networks of actors and institutions (Blocker & Barrios, 2015; Koskela-Huotari & Vargo, 2016) – such as social rules and norms – as critical components of service ecosystems (Schultze & Orlikowski, 2004). We adopt a transdisciplinary approach grounded on the theories of socio-economics, biological ecosystems, philosophy, service science, marketing management and information systems under the service-dominant logic (Lusch, Vargo, & Gustafsson, 2016).

One of the most widely discussed taxonomies of sustainable service ecosystems adopts a transdisciplinary approach (Lusch *et al.*, 2016) to establish a unified framework of analysis independent of specific disciplinary perspectives (Stember, 1991). This idea leads to a new perspective of service ecosystems, under the service science, consisting of the macro-theory of the service-dominant logic; and (2) the micro-theory of social construction and social capital theories (Lefebvre *et al.*, 2016) in hedonic SNSs, like Instagram (Kim, Kim, & Lei, 2012).

The macro-theory of the service-dominant logic and the micro-theory of social construction and social capital theories are connected through the institutional logics (Edvardsson *et al.*, 2014; Matthies *et al.*, 2016) that qualifies service platforms functionalities for the creation of a network of users and materialises in SNSs that function as a service platform delivery system.

2.5.2. Macro-theory in service ecosystems

The application of the service-dominant logic to the ecosystem of services is foundational for the progress of service science. An open-service ecosystem enabled by a model-driven approach is a: *'network of agents and interactions that integrate resources for value co-creation'* (Ng *et al.*, 2012:1).

The service-dominant logic offers the more comprehensive and complete approach to service science, in which service is defined as the exchange that is solely based on *competences* applied in order to benefit another actor (Vargo & Akaka, 2012). Research on *competences* in service ecosystems *'confirm(s) two broad behaviourally based conceptualizations of competence: 1) extra-role behavior demonstrated through organizational citizenship behavior, and 2) in-role behavior demonstrated through understanding of work, and engagement behavior'* (Waseem, Biggemann, & Garry, 2018:1).

The service-dominant logic determines the formation of markets, as well as their reform. The service-dominant logic focuses on service (eco)systems as the fundamental unit of analysis (Maglio & Spohrer, 2008). Service science is a transdisciplinary body of knowledge based on a symbolic process that computes the value associated with interactions congruently between (service) systems (Maglio, Vargo, Caswell, & Spohrer, 2009; Spohrer, & Maglio, 2010).

We rely on systems theory and a structurational model (Schultze & Orlikowsk, 2004) to explore technology's dual social and structural role during mutual interactions between humans and technology. These theoretical accounts consider that value co-creation (Yi & Gong, 2013; Yi, Nataraajan, & Gong, 2011) is systemic (Meynhardt *et al.*, 2016) and is mediated by a set of origins, factors, components and consequences. Value is systemic due to the micro-macro links in a service ecosystem (Meynhardt *et al.*, 2016). Therefore, we will consider the systemic property of value and the effectiveness of interactivity in customer value co-creation behaviour with increased levels of advocacy during unplanned and voluntary usage of hedonic SNSs.

2.5.3. Micro-theory in service ecosystems

In the field of consumer behaviour, value has been defined as *'an interactive relativistic preference experience'* (Holbrook, 1994:21). Grönroos (2000), Gummesson (1998) and Vargo & Lusch (2004) took a similar view, in which value is conceived as an extension of the paradigm of consumption theory.

Consistent with Holbrook's (1994) concept of value, intrinsic value is perceived by the customer as a beneficial experience in itself, and it emerges when the customer can adapt his or her consumption experience to their own needs. Instead, extrinsic value arises when the customer experience helps the customer to achieve a later end. Holbrook's (2006:715) definition of extrinsic value considered that *'a product or consumption experience serves instrumentally or functionally as a means to some further end'.* For example, a user's interactivity with other users is a source of extrinsic value that allows exchanging experiences, information and group identity (Blasco-Arcas, Hernandez-Ortega, & Jimenez-Martínez, 2013).

Value is created when actors consume goods and services (Fırat & Dholakia, 2006; Cova & Dalli, 2008). Given that customers create value when they use goods and services, they attribute real value to them. Therefore, consumers are bound to create goods and services by creating their consumer objects materially and culturally (Keat, Whiteley, & Abercrombie, 2003). Furthermore, consumers contribute to the development of the main elements of the consumer culture, which are knowledge, meaning and affection, in addition to contributing to the economics of exchange markets. Thus, generating consumer culture is a social endeavour based on customer-to-customer interactions (Godbout & Caille, 1992).

The service-dominant logic perspective places value at the centre of service ecosystems (Smith & Ng, 2012). It underlies the contextual and experiential factors of value co-creation (Lenka, Parida, & Wincent, 2017) by shifting the approach to value towards value-in-use (Vargo, Akaka, & Vaughan, 2017) and value-in-context (Laud & Karpen, 2017). Solakis, Peña-Vinces, & López-Bonilla (2017) emphasised the difference between value-in-use and value-in-context. Ballantyne & Varey (2006) argued that value propositions are co-created through dialogue amongst customers to facilitate value-in-use generation. Bidar *et al*. (2016) and Zhang *et al*. (2015) argued that customer value co-creation experiences positively influence customer's intention to participate due to the learning, social and hedonic benefits of value.

Also, a service-dominant logic perspective of service ecosystems facilitates a networked system of resource-integrating actors since value connects actors (Lusch & Vargo, 2014b) through joint efforts of value co-creation (Lusch, Vargo, & Tanniru, 2010; Vargo & Lusch, 2011). Extant research on the micro-theory of service ecosystems (Meynhardt *et al*., 2016) provides a better

explanation for the concept of value generation (Vargo, Akaka, & Vaughan, 2017) using a network-centric approach to the creation of social capital[19] (Edvardsson, Tronvoll, & Gruber, 2011).

Under social construction theory, meaning and symbols are essential elements that explicate value creation mechanisms (Maglio, Kieliszewski, & Spohrer, 2010). Meaning in service systems is socially constructed; symbols play an intra-role in customer behaviour and an extra-role in the interaction with other entities of the service systems during value co-creation. Maglio, Kieliszewski, & Spohrer (2010) argued that meaning is socially constructed in service systems, since symbols conduct users' internal behaviour and mediate during interactions with other entities. Maglio, Kieliszewski, & Spohrer (2010) suggested that symbols are central to service ecosystems and argued that the manipulation of symbols is an essential mechanism for value co-creation. This process implies that a service-dominant logic view of service ecosystems considers the exchange of intangible (operant) resources and emphasises processes instead of outcomes.

In addition, the social construction and social capital theories explicate the creation of value-in-(social)context and the creation of value-in-use as long as both are perceived as a satisfactory unified experience by the customer (Helkkula, Kelleher, & Pihlstrom, 2012; Matthies *et al.*, 2016)[20]. Therefore, we use the social construction and social capital theories in this thesis, exemplified in the Coleman bathtub of resource integration for the creation of value (Laud & Karpen, 2017).

2.5.4. Shared institutional logic links macro- and micro-theory

We connect macro-theory and micro-theory through the concept of shared institutional logic (Lounsbury & Crumley, 2007) in service platforms (Lusch & Nambisan, 2015) under the service-dominant logic. Shared institutional logic explains the role and the functioning of internal arrangements, such as institutions and social norms, in open service ecosystems (Edvardsson *et al.*, 2014). Institutional narrative, institutional arrangements and institutions (macro-level) facilitate the role of value (micro-level) in service ecosystems. Institutions and institutional arrangements enable value generation processes in service ecosystems. In turn, value generation processes facilitate the generation of institutions and institutional arrangements. Value, as well as institutions and institutional arrangements, keep together the different and nested levels in the service ecosystem (Meynhardt *et al.*, 2016; Vargo & Lusch, 2016).

For this reason, actor-to-actor interaction, or C2C interaction, is defined as the *'interfacing and exchanging'* (Chandler & Lusch, 2015:12), happening due to the institutional logics of a service ecosystem, while at the same time building and maintaining this logic through shared institutional logic.

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[19] Social capital theory explains human behaviour and the relationships of people with the social structure. Social capital theory uses service-dominant logic to explain the concept of resources, such as skills, knowledge and relationships that are embedded (Laud, 2015) in a service ecosystem through institutional arangements and the concept of integration of resources, since: (1) resources exist integrated into social structures; (2) resources are mobilised through social interaction; and (3) actors mobilise resources to maximize utility. This understanding complements the service-dominant logic perspective that actors release the potential value hidden in resources (Laud & Karpen, 2017).

[20] Berger & Luckmann (1966:111) argued that all information, including the most daily, routine, tedious and common sense reality, is created and supported by social interactions. Berger and Luckman's *The Social Construction of Reality*, published in 1966, investigated symbolic interaction and the phenomenology of value rooted in knowledge: *'in other words, "knowledge" precedes "values" in the legitimation of institutions'*, and its relationship with value co-creation (Alan, 2014; Blumer, 1969; Charon, 2001; Clarke, 2003; Denzin, 1996; Ellis, 1991; González-de-la-Fe, 2003; Gramski, 2005; Solomon, 1983). According to social construction theory: *'taken-for-granted realities'* are developed during the interaction amongst social agents (Berger & Luckmann, 1966:119).

Meynhardt *et al.* (2016) considered the specific cumulative effect of the concept of synergy to study self-organising systems through micro-macro level interactions. Value is systemic due to the micro-macro links in a service ecosystem. This means that the bottom-up processes lead to subsequent top-down restrictions on the synergetic processes portrayed in Coleman's bathtub (1990). He used the concept of synergetic to explain self-organised systems through micro-macro level interactions (micro-foundations): *'synergetics and its core principles of emergence and enslavement (consensualisation) (uphold) that value is a systemic property (i.e. an order parameter) that emerges from micro-macro links in service ecosystems'* (Meynhardt *et al.*, 2016:2981).

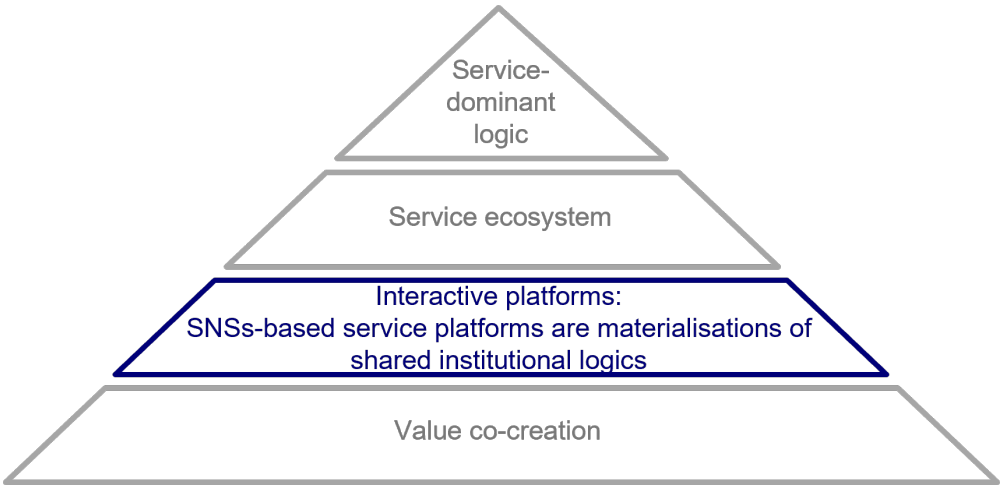
Macroscopic properties emerge from micro-level (bottom-up) processes, which restrict subsequent micro-level activity to play by the rules of the game (top-down). For example, Opp (2011:209) claimed that a process is synergetic if: *'there is a macro proposition, its independent variables have causal effects on independent variables of a micro-theory, and the dependent variable of the micro-theory has a causal impact on the dependent variable of the macro proposition'*.

Service platforms are materialisations of the institutional logics, which are integral to service ecosystems (Vargo, Wieland, & Akaka, 2015). A service platform is modular because it possesses tangible and intangible resources that facilitate actors' interactivity with resources, improving resource bundles' density. It uses rules of exchange or protocols during service exchange (Lusch & Nambisan, 2015). Thus, actors and resources can interact with the service platform.

Although the concept of a service platform has been widely used in several fields, including health care (Lee *et al.*, 2014), we limit the scope of service platforms to hedonic SNSs. This is due to the ability of hedonic SNSs like Instagram to enable unplanned and voluntary usage and the ability to track user's interactions with other users during value co-creation activities with increased levels of advocacy towards the hedonic SNS.

The definition of a service platform by Bidar, Watson, & Barros (2016) followed the same line of reasoning, and it underscored the type of customer interactions that lead to value co-creation. Service platforms mediate between networked actors and help them align their resources and deliver services by facilitating resource matches and service exchanges (Barros *et al.*, 2000). Similarly, the definition of a service platform by Lusch & Nambisan (2015) pointed up its modelling structure, which facilitates the interaction between users and resources, hence the label of 'interactive' given to such platforms. Scholars (Burgoon *et al.*, 1999; Meyronin, 2004) argued that service platforms enhance interaction amongst actors and accelerate information exchange. Thus, it increases communication, which facilitates value co-creation (Barnes, Hinton, & Mieczkowska, 2005; Burgoon *et al.*, 1999; Meyronin, 2004). In addition, Lusch & Nambisan (2015) stated that a service platform (delivery systems) is assembled into modules that facilitate the interaction of users and resources (see Diagram 6).

Diagram 6. Interactive platforms



2.5.5. Service platform functionalities for the creation of a network

A service or interactive platform is designed around nodes and dyadic links so that customers can facilitate the creation of a user network and its outcomes (Kane, Alavi, Labianca, & Borgatti, 2014). The design of nodes and ties on a platform can standardise consumer behaviour and affect the construction and outcomes of networks. Nambisan & Lusch (2015) stated that service innovation in service platforms, under service-dominant logic, should focus on C2C interactions, the liquefaction (digitalisation) and integration of resources, and finally, the creation of density of resources (whether resources can be used for service at a given time, place or context).

A service platform is designed to benefit from the interaction amongst users, reinforcing the institutional logics of such a service platform (Vargo, Wieland, & Akaka, 2015). In addition, a service platform promotes the attainment of: *'domain knowledge, sociability, usability and hedonic dimensions'* (Bidar, Watson, & Barros, 2016:6) such as customer empowerment (Kohler, Fueller, Matzler, & Stieger, 2011; Kohler, Matzler, & Füller, 2009), leading to participation and enjoyment through control and self-determination (Fuller, Muhlbacher, Matzler, & Jawecki, 2009).

Additionally, the design of appropriate tools for interaction is crucial for value co-creation (Carlson *et al.*, 2018). Adequate tools for interaction[21] are critical for productive co-creation ventures in order to motivate and encourage co-creators. The atmosphere must feel authentic, so co-creators understand that they participate in something real (Hollebeek & Solem, 2017). The selection and design of suitable tools for interaction is essential for accomplishing co-creation and the stimulation of co-creators through adoption and loyalty (Kumar, Purani, & Viswanathan, 2018). The design of interactive tools drives value co-creation and the construction of environments that are perceived as authentic by co-creators (Fuller *et al.*, 2009; Kohler *et al.*, 2011; Bidar, Watson, & Barros, 2016).

[21] A co-creation platform should be adapted to users' expectations and his or her perception of value. An effective interactive platform provides features that enable goods knowledge to help users to generate creative ideas and increase consumption (Fuller *et al.*, 2009). The platform´s functionalities must be interactive, facilitating the understanding of the good, helping to articulate new ideas, and engaging customers in value co-creation (Bidar, Watson, & Barros, 2016).

In line with the institutional logics, a broader perspective of a belief system such as a digital environment that feels real (Park, Shin, & Ju, 2020) shapes the cognition and behaviour of actors. In turn, actors modify the capabilities of a service ecosystem and consequently transform the environment features, so it feels even more real. This implies that the relationship between user interactivity and value co-creation follows the institutional logics (Vargo, Wieland, & Akaka, 2015). Furthermore, this relationship portrays macro-micro-macro causal relationships of macro-conditions (such as service platforms) to individual actions, which result in macro-outcomes once aggregated with other individuals' actions (Coleman, 1990).

2.5.6. SNSs as service platform delivery systems

A service platform based on SNSs is an integral part of service ecosystems[22], and it is aimed at encouraging people to participate in joint co-creation of value (Bidar *et al.*, 2016). SNSs encapsulate collective intelligence to exploit and leverage operant resources such as skills, knowledge and relationships for value co-creation purposes.

One of the foundational premises of the service-dominant logic is that customers are the main co-creators of value (Payne, Storbacka, & Frow, 2008; Vargo & Lusch, 2008b; Bidar *et al.* 2016). Users dynamically work with other users and organisations and employ their operant resources to develop new product offers (O'Hern & Rindfleisch, 2010; Zhang, Lu, Wang, & Wu, 2015), services (Vargo & Lusch, 2004) and customer experiences (Grönroos, 2008; Prahalad & Ramaswamy, 2004; Rowley, Kupiec-Teahan, & Leeming, 2007).

Lusch & Vargo (2006b) argued that value is jointly co-created through interactions amongst users during the integration of operant resources (like skills and knowledge) and operand resources (such as tangible artefacts). Due to the active roles that customers play during cooperation, it is essential to study user's behaviour during resource integration to understand the process of value co-creation (Xie, Bagozzi, & Troye, 2008).

2.6. The role of resource integration in value co-creation

The integration of resources by customers using hedonic SNSs is achieved through an interactive combination of personal operant resources, such as skills, knowledge and relationships (Kleinaltenkamp *et al.*, 2012; Edvardsson *et al.*, 2014; Arnould, 2008). In addition, since resources are embedded in service ecosystems, resources can be recombined through the institutional logics in the context of an engagement platform (Nenonen & Storbacka, 2009; Edvardsson *et al.*, 2014).

Therefore, customers produce market value through social interaction, although customers might disapprove of the market or some of its agents and elements (Cova & Dalli, 2008; Bidar, Watson, & Barros, 2016). Market value is created and apprehended, even by some type of resistance or problem association, if a support group is developed to sustain it. This is aligned with the thinking

[22] An SNS encapsulates collective intelligence to exploit and leverage operant resources such as skills, knowledge and relationships for value co-creation. For example, online platforms use the collective intelligence of customers – their skills and knowledge – to co-create self-services.

of Prahalad & Ramaswamy (2000, 2004) and Ballantyne & Varey (2006), when an earlier version of value co-creation was developed.

From a service-dominant logic perspective, customers – instead of businesses – frequently possess access to key operant resources required in an exchange (or more precisely interactive interchange) of experiences. Therefore, customers should be considered principal allies and partners in the value creation process. Furthermore, customers operate on social networks by exchanging experiences, which affect their individual experiences: *'all social and economic actors are resource integrators'* (Vargo & Lusch 2008:7). Therefore, customers are considered value co-creators, if not the actual owners of value creation (Gummesson & Mele, 2010), as value co-creation originates in the interaction and integration of resources (Alves, Ferreira, & Fernandes, 2016).

We argue that there is not enough research on the antecedents and consequences of the process of resource integration at the individual level, particularly of the role that individuals play as depositaries of skills and knowledge (Edvardsson *et al.*, 2014) and his or her relations with other individuals during user interaction (Tueanrat, Papagiannidis, & Alamanos, 2021). Vargo, Maglio, & Akaka (2008) examined patterns of resource integration during customer value co-creation behaviour by studying service ecosystems in the context of service science and service-dominant logic.

Value-in-use and value-in-context are central in creating core values in service ecosystems due to customers' interaction and integration of resources. The integration of resources is the mechanism for the co-creation of core values that shapes a service ecosystem and creates a sustainable competitive advantage (Hamel & Prahalad, 1990):

- core values are the deep-routed and unchangeable beliefs and attitudes that drive the behaviour of individuals and their groups.

- core values reflect the norms and the culture of a service ecosystem and differ from the foundational values that shape society as a whole (Waddock & Bodwell, 2007).

The integration of resources is a process that requires collaboration (Kleinaltenkamp *et al.*, 2012) for the promotion of the common core values (shared institutional logic) of a service ecosystem, and it results in value resonance (as opposed to value dissonance), which in turn encourages innovation (Vargo, Wieland, & Akaka, 2015).

We consider that the process of resource integration under the service-dominant logic (unlike service-logic) works as a systemic concept (Meynhardt *et al.*, 2016) through four distinct and related mechanisms: (1) the activation of operant resources like skills, knowledge – and to some extent technology (Abul, Siddike, Hidaka, & Kohda, 2021; Akaka & Vargo, 2014) – and relationships; (2) the exchange of resources (Nenonen & Storbacka, 2009); (3) the interactivity amongst actors of the service ecosystem (Heinonen *et al.*, 2018); and (4) the generation of user resource integration patterns that fosters core values and result in value resonance.

By characterising resource integration as a systemic process, we mean that SNSs functionalities manifest in resource integration properties: (a) the process of resource integration is mediated by network interactions; (b) the process of resource integration is associated with the significant role of the self of the actor:

a. The process of resource integration is mediated by network interactivity, in which motivational properties (*perceived personalisation and playfulness*), relational properties (*connectedness*), and informational properties (*responsiveness*) allow users to process information in the most appropriate way, prepare information and create persuasive content (Voorveld *et al.*, 2011). Moreover, content creation is essential for other users, since it stimulates mental imagery and information processing (Rodríguez-Ardura & Meseguer-Artola, 2016), which is an antecedent for perceived interactivity.

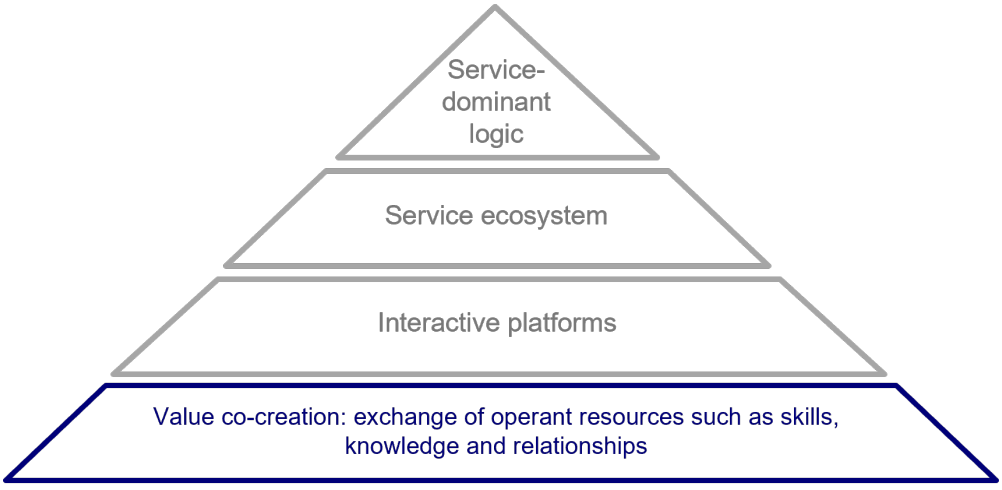
b. The process of resource integration is related to the significant role of the self of the actor in his or her behaviour (Belk, 1988; Ladik, Carrillat, & Tadajewski, 2015; Sheth & Solomon, 2014) in relational properties (*two-way communication*), behaviour (*perceived behavioural control*) and temporal properties (*time*)**.** This is the perceived interactivity of consumers that managers of organisations can observe and measure when customers interact with other customers during the exchange of operant resources.

2.6.1. Exchange of operant resources

Skills, knowledge and relationships are operant resources mobilised during the service exchange process of actors interacting within the network (Nenonen & Storbacka, 2009). Operant resources such as skills, knowledge and relationships – defined as social and psychological resources (Hau, Tram Anh, & Thuy, 2017) – are activated and mobilised (exchange) in value co-creation behaviour through customer's extrinsic motivations (Ryan & Deci, 2000)

Operant resources are non-physical or intangible resources and generally human, organisational, informational, and relational elements. Such resources are activated in the interaction amongst actors and the interaction amongst resources (Hakansson *et al.*, 2009). The value of operant resources depends on their relationship with other resources; resources change over time, create tension, and are embedded into a broader context (Peters, 2016) (Diagram 7).

Diagram 7. Value co-creation



A common idea in service ecosystems is that the locus of value co-creation is not within firms, but in the mutual exchanges of operant resources during C2C interactions. Inter-agent resource exchange (Håkansson *et al.*, 2009) and interaction precede the integration of resources, since:

'resources (are) highly dynamic functional concepts; that is, they are not, they become, they evolve out of the interaction of nature, man, and culture' (Zimmermann, 1951: 814 –815).

In service ecosystems, value co-creation is generated through the exchange of operant resources (knowledge, skills and relationships) amongst networks of users (Kutsikos, 2009). For actors to be resource integrators, operant resources are the principal source of competitive advantage (Vargo & Lusch, 2008b). Service-dominant logic postulates that service, especially: *'skills and knowledge is the fundamental unit of exchange'* (Vargo & Lusch, 2004:3). These exchange units (i.e. operant resources) allow actors to exploit resources and achieve the exchange of service-for-service (Haase & Kleinaltenkamp, 2011).

2.6.2. Interactivity mobilises embedded operant resources

Interactions between the separate components of service systems form service ecosystems (Poels, 2010; Scheithauer, Augustin, & Wirtz, 2009) which in turn form the context for value co-creation – a process that can inspire new value proposition in organisations (Ordanini & Pasini, 2008). Interaction amongst actors, such as network interaction and the perception of interaction, reflects the integration of social and psychological operant resources[23].

Resource integration is inter-subjective. This inter-subjectivity generates the integration of resources, which isolated actors do not simply achieve. Resource integration is thus a subjective experience between interacting actors. Since the interaction process comprises symbols used to control actor-to-actor interactions, *'symbols are more important than matter'* (Peters & Pressey, 2009:13).

The concept of embeddedness provides an understanding of how relational structures govern the process of resource integration and the outcome of social capital (Laud *et al.*, 2015). A system should own or be the custody owner of a sufficient number of resources to fulfil the core services, i.e., to comply with essential services, through institutional arrangements.

Stated slightly differently, a service ecosystem holds resources that can be mobilised as a service offer, jointly co-created by actors. We recognise that a service system can be this fundamental source or can act as the owner of the rights to mobilise resources (Grotherr *et al.*, 2018). In both cases, resources are the basic elements mobilised by the service system (either separately or collectively) to make a service offering (Kutsikos, 2009).

2.6.3. Resource integration patterns

Social and psychological factors operate during the integration of resources. There are two types of resource integration patterns: *'social interaction'* or *'summative'* (Ballantyne & Varey, 2006; Fyrberg, Jüriado, & Juriado, 2009) and *'emergence'* (Clayton & Davies, 2006); both types of resource integration patterns, generate value but of different nature (Peters *et al.*, 2014:6).

[23] The traditional classification of different operant resources refers to organisations and considers seven categories (Madhavaram & Hunt, 2008:67): 'financial, physical, legal, human, organisational, informational and relational'. However, we study three more general categories that refer to customers, and these comprise all other operant resources: skills, knowledge and relationships. These three core resources are embedded into a broader service ecosystem as social capital (Laud *et al.*, 2015).

To understand the integration of resources as a process of *'social interaction'* or *'summative'*, we observe this through the lens of network interactivity of key actors and their resources (Peters *et al.*, 2014:7). Consequently, we explore the mechanisms that actors not: *'acting as individuals but as social and cultural actors'* (Lusch *et al.*, 2016:2961) integrate resources in networks of users and examine how absorptive capacity[24] (Alves *et al.*, 2016) works in line with socially interactive abilities that are labelled operant resources (Yi & Gong, 2013).

In resource integration, interactions give the status of resources to specific objects, people, machines, money, institutions or concepts that intermingle with other resources (Harrison & Hakansson, 2006). Scholars have discussed the relation between interaction, resource integration, and service-dominant logic (Ballantyne & Varey, 2006; Fyrberg & Jüriado, 2009). In order to examine the mechanisms of resource integration in networks, we study how regimes of appropriability (motivational factors), social integration mechanisms (informational factors) and power relations (relational factors) function adequately (Peters & Pressey, 2009).

Similarly, to understand the practices of resource integration as the *'emergence'* of new knowledge (i.e., insights) that results from the interaction of user's resources and the psychological practices in which they occur, we observe this process through the lens of perceived interactivity (Peters, 2016:3). Smith (2010) argued that emergence is related to the elaboration of new entities – with their own new properties such as configuration, characteristics, capabilities, etc. – through the interactive combination of different entities. We consider the integration of resources at the micro-level of relational governance[25] and cognitive network theory and in the broader context of

[24] Peters & Pressey (2009) stated that the ability of networks to identify, incorporate and apply new knowledge to create new value is a process driven by coherence. This process is called *absorptive capacity*. Todorova & Durisin (2007) identified three contingent factors that increase or decrease this capability; regimes of appropriability (motivational factors); social integration (informational factors); and power relations (relational factors).

- *Regimes of appropriability* (motivational factors) regulate the motivation of users to learn and innovate; these factors moderate between absorptive capacity and previous sources of knowledge (Cohen & Levinthal, 1990) and between absorptive capacity and the resulting sustainable competitive advantage (Zahra & George, 2002). Therefore, regimes of appropriability encourage or discourage members of the network from participating in value co-creation (Peters & Pressey, 2009).
- *Social integration* (informational factors) promote connectivity and shared meanings. Merali (2000) stated that an actor forms a knowledge fabric or scheme (the structure of his or her knowledge) because he or she acts in a context that is redefined by the knowledge fabric that other actors create. Thus, communal group schemes are formed and these groups support collective consciousness, define how knowledge is retrieved and used according to collective actions (Peters & Pressey, 2009). However, Todorova & Durisin (2007) argued against existing embedded knowledge: this is knowledge that is comprised of established abilities (França & Ferreira, 2016) and traditional cognitive ideas that obscure new external knowledge. Traditional thought patterns, which are deeply ingrained in the network, separate participants from new opportunities.
- *Power relations* (relational factors) interact with cognitive processes, such as learning and skills; these factors are considered contingent factors (Todorova & Durisin, 2007). Learning can be affected by the number of resources and power relations; this explain why the network only uses part of the new knowledge available and how some organisations can benefit from partnerships in external knowledge networks. Therefore, power relations influence the degree of use of new knowledge (Todorova & Durisin, 2007).

[25] We consider in our research four theories that explain resource integration, ranging from the relational to the structural; these differ in the processes, and in the ways these theories consider collaboration from (1) the micro-level and more voluntary, participatory, networked and cognitive of *relational governance* (Heide, 1994) to (2) the macro-level and more structured of *configuration theory* (Miller, 1987), *effectuation theory* (Read, Dew, Sarasvathy, Song, & Wiltbank, 2009) and *structuration theory* (Giddens, 1984; Kleinaltenkamp *et al.*, 2012).

- *Relational governance*: Haase & Kleinaltenkamp (2011) and Heide (1994) studied the mechanism that governs collaboration that results in the integration of resources. Since collaboration is voluntary, actors need to identify the benefit obtained in the participation, and if the benefit is not apparent, then collaboration is not likely to occur (Haase & Kleinaltenkamp, 2011).
- *Configuration theory*: Hughes *et al.* (2012) argued that configuration theory explains how organisations shape their resources in response to the context through the agency of their members. Although technology is key to

cognitive consistency theory[26] (Monge & Contractor, 2003), where cognition leads to consistency (Peters & Pressey, 2009).

In resource integration as emergence, the ability of customers to identify new knowledge is driven by coherence (Peters, 2016). Processes that are driven by coherence[27] favour decision-making if the various pieces of the cognitive field fall into place or are consonant (Simon & Holyoak, 2002; Simon *et al*., 2004). Consistency theorists defend theories of conflict and avoidance of ambiguity whenever customers share interpretations for message content. In turn, consistency leads to a state of equilibrium, a homeostatic state by which the motivation to change diminishes (Simon, Snow, & Read, 2004). Equilibrium is achieved through a balance of evidence and conclusion. Actions transform beliefs and attitudes, which in turn promote additional actions. The construction process of reality through information, evaluation and actions lead to the emergence of reality (Peters & Pressey, 2009).

2.7. Theoretical accounts of customer value co-creation behaviour

Lusch, Vargo, & Gustafsson (2016) argued that value co-creation is one of the most debated concepts in service-dominant logic research. Storbacka *et al*. (2016) emphasised the difficulty of finding empirical support to value co-creation. Since value is created during the interaction amongst users of hedonic SNSs and the integration of their personal operant resources, we focus in this thesis on interactivity and resource integration in section 2.8 (Vargo, Maglio, & Akaka, 2008).

Despite widely discussing customer value co-creation behaviour in the scientific literature, a search in 29th January 2021, on ISI Web of Science showed that amongst the 419 articles that addressed the concept of value co-creation, little agreement is reached on a common definition of the co-creation 'label' (Ramaswamy & Ozcan, 2018:196). Value co-creation has been linked to different topics. The variety of concepts of customer value co-creation behaviour has been related to:

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the integration of resources, the role of the users that interact with technology is central to service systems (Spohrer & Maglio, 2008).

- *Effectuation theory*: Hughes *et al.* (2012) stated that resource integration requires collaboration; Read *et al*. (2009) stated that the rationale for the existence of organisations is dubious, and collaboration primarily occurs due to the commitment amongst networked actors.

[26] Consistency requires modification in the cognition of actors. Peters & Pressey (2009) stated that *cognitive theory* – that studies the learning process of individuals – applied to networks focuses on the shared meaning of common objectives and narratives (Melancon, Noble, & Noble, 2011). Cognitive consistency theory studies the mechanisms that individuals follow to seek consistency in their cognition (Monge & Contractor, 2003); it explains modifications in beliefs, attitudes and behaviours of actors who seek consistency (Festinger, 1957). Peters & Pressey (2009) stated that when the theory of cognitive consistency is applied to networks, it focuses on the shared meaning of common objectives and narratives and explains the modifications in beliefs, attitudes and behaviours of actors who seek consistency (Festinger, 1957), i.e. user's perception of value. A typical example in hedonic SNSs is when people become friends. This motivates that, at the network level, users seek consistency in the participation, attitudes and relationships with friends in the network.

[27] Our culture shapes our thinking. Our social and cultural context influences our cognitive processes during resource integration, so actors seek coherence, leading to a balanced mental state (Hollebeek, 2018). Cognitive aptitudes are skills, such as problem-solving that apply new information and critical thinking in three areas: verbal, math and logic and, finally, spatial reasoning (Casey, Nuttall, & Pezaris, 2001).

- invention and implementation of goods and services (Füller & Matzler, 2007; Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010; Mahr, Lievens, & Blazevic, 2014; Matthing, Sanden, & Edvardsson, 2004; Nambisan, 2010; Sanders & Stappers, 2008; Sawhney, Verona, & Prandelli, 2005).
- innovation through user collaboration (Bogers, Afuah, & Bastian, 2010; von Hippel, 2005).
- product customisation by users (Franke & Piller, 2004; Syam & Pazgal, 2013).
- new belief systems (Xie, Bagozzi, & Troye, 2008).
- co-production (Ranjan & Read, 2014; Bendapudi & Leone, 2003; Etgar, 2008; Ramírez, 1999).
- participation and sharing in the communities (Cova & Dalli, 2009; Kozinets, Hemetsberger, & Schau, 2008; Wilson, 2013).
- retail (Andreu, Sanchez, & Mele, 2010).
- know-how, education and problem-solving in network organisations (Hakanen, 2014; Komulainen, 2014).
- business network working in partnerships and associations (Ceccagnoli, Forman, Huang, & Wu, 2012; Grover & Kohli, 2012).
- new business models of open innovation (Chesbrough, 2006).
- services exchange within service ecosystems (Ballantyne & Varey, 2008; Grönroos, 2012; Grönroos & Voima, 2013; Lusch & Vargo, 2006, 2014; Payne, Storbacka, & Frow, 2008; Spohrer & Maglio, 2008).

Although Ramaswamy (2004) is recognised as the first scholar to define co-creation, Cova & Dali (2008:2005) compiled the first recollection of the various research streams of value co-creation. As witnessed in the 21st century, a resurgence of the service-dominant logic perspective in digital marketing research (Vargo & Lusch, 2017) can help us to reframe the concept of value co-creation under the service-dominant logic perspective. Based on this, we select the service-dominant logic research stream, which empirically studies: (1) the interaction between consumer and producer during co-creation; and (2) the consumer as the integrator of resources (see Table1).

Table 1. Research streams on the co-creation of value

Research stream	Consumer-producer relationship	Central topic
Consumption experience	Immersion	Appropriation by consumers
Co-production	Service encounter	Integration through consumer participation
Service dominant logic	Co-creation	Consumer as a resource integrator
Collaboration innovation	Collaboration	Consumer as developer and marketer

Research stream	Consumer-producer relationship	Central topic
Consumer empowerment	Power	Responsibility of consumers
Consumer tribes	Collective actions	Consumers as competitors
Consumer resistance	Subversion	Hijack by consumers

Source: Cova & Dalli (2008:2005).

Since Vargo & Lusch's (2004) presented the fundamental premises of the service-dominant logic, numerous studies have dealt with this concept; however, service-dominant logic still lacks complete conceptual clarity (Vargo & Lusch, 2017). A key concept in service-dominant logic is value co-creation. Value co-creation is confused with earlier concepts such as co-production or co-innovation (Alexander, 2012). It captures the idea that value is not merely elaborated by the service provider, but generated mainly amongst the customers that interact with the service provision.

A better understanding of the concept of value co-creation reduces inconsistencies about: (1) the effect of value co-creation in the network of customers, such as the locus of value co-creation, dimensions, actors and their interactions; and (2) the relationship between the value co-creation process and their consequences (Neghina, Caniëls, Bloemer, & van Birgelen, 2015). Also, reaching a consensus on the definition of value co-creation is crucial for service science (Ostrom, Parasuraman, Bowen, Patrício, & Voss, 2015).

Since customer value co-creation behaviour is foundational for service-dominant logic (Cova & Dalli, 2008), we review the different definitions of value co-creation in the literature (Arai, 2016; Damkuviene *et al.*, 2012; Ercsey, 2016; Galvagno & Dalli, 2014; Grönroos, 2009; Keranen & Ojasalo, 2011; Macdonald, Wilson, Martínez, & Toossi, 2011; Moreno de García & Calderon, 2017; Payne *et al.*, 2008; Polese, Mele, & Gummesson, 2014; Schau *et al.*, 2009; Shamim & Ghazali, 2014; Skaržauskaitė, 2013).

The concept of value for the user in the service-dominant logic research stream states that: *'the customer is always a co-creator of value'* (Vargo & Lusch, 2008a:148). However, this statement initially was: *'the customer is always a co-producer of value'* (Vargo & Lusch, 2004:3). Vargo & Lusch (2008a) reformulated the concept of value and considered that it is co-created during the interaction amongst users and the integration of their individual operant resources (Vargo, Maglio, & Akaka, 2008).

Customers contribute to value creation by integrating their individual resources acquired through different actions and interactions with other customers (Arnould, Price, & Malshe, 2006, Baron & Harris, 2008). Although of varied nature, customers have a dynamic role in service delivery and the obtained benefits (McColl-Kennedy *et al.*, 2012; Prahalad & Ramaswamy, 2003; Vargo & Lusch, 2004). Under the service-dominant logic, customers always generate value, since they are fundamentally involved in the configuration of value (Payne *et al.*, 2008; Vargo & Lusch, 2008b; Sweeney, Danaher, & McColl-Kennedy, 2015). For this reason, hedonic SNSs are defined as customer-centric models in service ecosystems.

A literature review of the notion of customer value co-creation behaviour in behavioural and service sciences, under the service-dominant logic, shows that value co-creation results from the

integration of customer's operant resources. Frow, Payne & Storbacka (2011) argued that value co-creation is an interactive process requiring two parties to collaborate, integrate their resources, and create value. In this line of thinking, extant research of customer value co-creation behaviour primarily focuses on the macro-level (Layton, 2007; Lusch & Webster, 2011; Lusch, 2006; Vargo & Lusch, 2011; Wieland, Polese, Vargo, & Lusch, 2012) instead of addressing the micro-level of *'service provision'* interactions (Chandler & Vargo, 2011:35).

Few papers empirically study the antecedents of customer value co-creation behaviour under the service-dominant logic, such as Chen & Raab (2017), Randall *et al.* (2011), Mc-Coll Kennedy *et al.* (2012) and Yi & Gong (2013). Chen & Raab (2017) established and verified the mandatory customer participation scale based on the micro-foundational Engel-Blackwell-Kollat model of customer behaviour (Ercsey, 2016). This scale comprises three dimensions (information participation, attitudinal participation, and actionable participation) and captures the customer's decision process related to restaurant service. However, we will not use such an operationalisation because it refers to mandatory customer participation, and we study voluntary customer behaviour.

As of 29th January 2021, Yi & Gong's (2013) is the most cited paper, of the four articles mentioned in the previous paragraph, in the ISI Web of Science, as at that time appeared 404 times in JCR-indexed journals. Furthermore, Yi & Gong (2013) performed the first academic effort to empirically address the multidimensional nature of customer value co-creation behaviour in SNSs under the service-dominant logic; previous studies considered the service-logic instead. These dimensions are customer participation behaviour and customer citizenship behaviour.

2.7.1. Domain and nature of value co-creation

Co-creation is the *'joint, collaborative, concurrent, peer-like process'* (Galvagno & Dalli, 2014:644) that generates innovation and value, both tangible and intangible. Value co-creation is a broader concept that includes all instances of value created by customer interaction with other customers (Vargo & Lusch, 2007; Ramaswamy & Ozcan, 2018), such as collaboration and co-production (Cova, Ezan & Fuschillo, 2013; Grönroos & Voima, 2013).

Value co-creation is a shared and cooperative process that is socially generated and produces new tangible and intangible value. There is a discussion in the literature regarding the most important dissimilarities differences between co-creation and co-production (Cova *et al.*, 2013; Grönroos & Voima, 2013; Ranjan & Read, 2014). However, we use a more general concept (Vargo & Lusch, 2007) that covers all procedures and facts through which firms and customers produce value through interactions. Galvagno & Dalli (2014) stated that co-creation is the mutual process of value creation amongst the interested parties materially and symbolically; they argued that co-creation encompasses all possible interactions between businesses and customers.

Value co-creation is the most discussed topic in service marketing during the last decade. However, the concept of value creation is still under development in terms of significance and accuracy (Shamim & Ghazali, 2014). Scholars debated different facets of value co-creation: the role of organisations and customers in value co-creation, the value of the co-creation experience, the ecosystems for value co-creation, the social perspective of value co-creation, etc.

The role the customer plays in the value co-creation process is still under discussion in the literature. We wish to strengthen the customer's role in the creation of value by studying his or her

interactive behaviour and the dialogue established with other customers. Two important actor's roles have been considered and incorporated into the value co-creation process: the experiential value (intra-role) and the social influence (extra-role) (Shamim & Ghazali, 2014)[28].

The study of value co-creation (Lusch & Vargo, 2006) shifts from a dyadic perspective of customer-firm, under the service-logic, to actor-to-actor (Lusch & Nambisan, 2015) or network-to-network (McColl-Kennedy *et al.*, 2012) in collaborative innovation (Benoit, Baker, Bolton, Gruber, & Kandampully, 2017). Opposite to co-production (Ranjan & Read, 2014), collaborative innovation is a voluntary extra-role during value co-creation (Galvagno & Dalli, 2014) in which participation of the customer in the product/service creation process is defined as customer engagement behaviour (Jaakkola & Alexander, 2014).

Fernandes & Remelhe (2016) stated that co-creation occur in different contexts by physical and digital means (Bolton & Saxena-Iyer, 2009). However, the debate in the literature does not present a perfect vision, and each definition of value co-creation considers a unique and different meaning. For example, the service-dominant logic considers the construct of value co-creation and defines suppliers and customers as co-creators of value (Lusch & Vargo, 2006), each interacting within his or her sphere of action. On the contrary, the service-logic deemed value creation an ongoing process in which the interaction occurs only in a common area whenever two or more parties interact (Grönroos *et al.*, 2013).

Few studies have empirically addressed the nature of the dimensions of customer value co-creation behaviour under the service-dominant logic (Ercsey, 2016). Previous research on customer value co-creation behaviour, under the service-dominant logic, has focused on co-production (Gummesson, 1996; Normann & Ramirez, 1993; Payne *et al.*, 2008; Ranjan & Read, 2014), co-operation (Bettencourt, 1997; Witte, 2014; Piligrimiene, Dovaliene, & Virvilaite, 2015), co-learning (Carayannis & Coleman, 2005; Sawhney & Prandelli, 2004), co-design (Ojasalo, 2009), information research and collation (Carida, Colurcio & Melia, 2014; Hirschman, 1987; Kellogg, Youngdahl, & Bowen, 1997; McColl-Kennedy *et al.*, 2012), co-delivery (Bovaird & Loeffler, 2012; Kannan & Chang, 2013) and co-innovation (Alexander, 2012).

2.7.2. Conceptualisation of customer value co-creation behaviour

We focus on the customer-centric view of value co-creation behaviour under the service-dominant logic. These interactions result in inter-subjective experiences (Löbler, 2011; Ricœur, 1983), that translate into the integration of resources amongst customers in the service network. These interactivities are both cognitive and behavioural, and they result in users' engagement in the service network, which varies from less demanding cooperation to more demanding emotional regulation (Sahu, Padhy, & Dhir, 2020). McColl-Kennedy *et al.* (2012:375) defined customer value co-creation as the benefit of integrating resources amongst collaborators who interact with other customers during service provision *'in the customer's service network'*.

In this definition, activities refer to the cognition and behaviour of the customer, and interactions apply to the interactivity amongst users, reflecting the individual's commitment to other customers

[28] Grönroos (2011) argued that interaction between the customer and the firm is an antecedent for value co-creation, whereas Shamim & Ghazali (2014) counter-argued that other frameworks are possible, such as customer experiential value (intra-role) and social influence (extra-role).

in the service network. Sweeney, Danaher, & McColl-Kennedy (2015:3) highlighted that these tasks could vary from easy and less complicated tasks with simple requirements, such as cooperation, to more complicated activities, such as *'emotional regulation'*. Sweeney, Danaher, & McColl-Kennedy (2015:3) defined customer value co-creation behaviour as the benefit resulting from resource integration by means of activities and interactions amongst customers linked to a network of users. In this definition, *'activities'* indicate the cognitive and active doing, and *'interactions'* reflect users' engagement with other users of the service network.

Ercsey (2016) argued that the most commonly used operational definitions of customer value co-creation behaviour under the service-dominant logic (Chen & Raab, 2017; McColl-Kennedy *et al.*, 2012; Randall *et al.*, 2011; Yi & Gong, 2011) differ in several critical factors, organised as dichotomous categories: (1) the viewpoint of the organisation versus the viewpoint of the customer; (2) value-in-exchange versus value-in-use of the service; (3) the integration of operand resources versus the integration of operant resources; (4) behavioural intention versus customer behaviour; (5) and physical environment versus online environment (see Table 2 and Figure 4).

Table 2. Conceptions of customer value co-creation behaviour

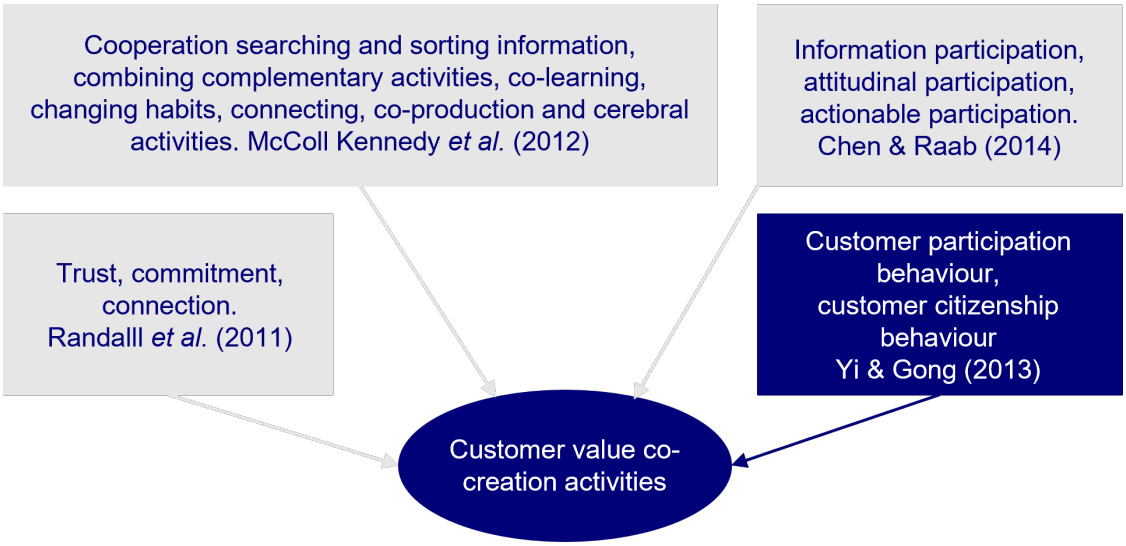
Study	Descriptions of customer value co-creation behaviour	Key dimensions
(Randall *et al.*, 2011)	Randall *et al.* (2011) focused on the firm perspective, service value-in-exchange, resource integration of operand resources and behavioural intention on physical environments.	Trust, Commitment, Connection
(McColl-Kennedy *et al.*, 2012)	McColl-Kennedy *et al.* (2012) argued that the scope of value co-creation could extend from a dyadic perspective to network-to-network contexts, as in the case of collaborative innovation. However, collaborative innovation is an optional, unplanned, added and voluntary customer effort to co-create value, unlike co-production. Thus, the collaborative aspect of value, or rather co-created value, emerges as a novel concept, wherein a single or multiple actors actively produce value that is complex, high-powered, interactive, and social in nature. Value co-creation behaviour generates resource integration due to the interaction amongst collaborators.	Cooperation, Searching and sorting information, combining complementary activities, Co-learning, Changing habits, Connecting, Co-production, Cerebral activities
(Chen & Raab, 2017)	Chen & Raab (2017) stated that customers do not only influence the value creation process; instead, customers are essentially co-creators of value. This perspective limits the role of the business as a mere facilitator of value propositions to customers. They demand more empirical studies to determine the consequences of the customer value co-creation process.	Information participation, Attitudinal participation, Actionable participation
(Yi & Gong, 2013; 2011)	Yi & Gong (2013; 2011) took an empirical approach and focused on the customer perspective, service value-in-use, resource integration of operant resources and online behaviour. They considered that customer value co-creation behaviour is a third-order factor compound of two dimensions, customer participation behaviour and customer citizenship behaviour.	Customer participation behaviour, customer citizenship behaviour

We argue that Randall *et al.* (2011) and Yi *et al.* (2013, 2011) presented opposing views of customer value co-creation behaviour under the service-dominant logic. On the one hand, Randall *et al.* (2011) focused on: the perspective of the organisation or the firm, service is measured as

value-in-exchange, the integration of operand resources and the behavioural intention in the physical environment.

On the other hand, Yi *et al.* (2013, 2011) and Yi, Gong, & Lee (2013) focused on: the customer's viewpoint, the measurement of service as value-in-use, the integration of operant resources and the behaviour of the customer online (Edvardsson *et al.*, 2014). Furthermore, Yi *et al.* (2013, 2011) adopted an empirical approach to the study of value co-creation. Thus, it is difficult to agree on a single definition of customer value co-creation behaviour under the service-dominant logic.

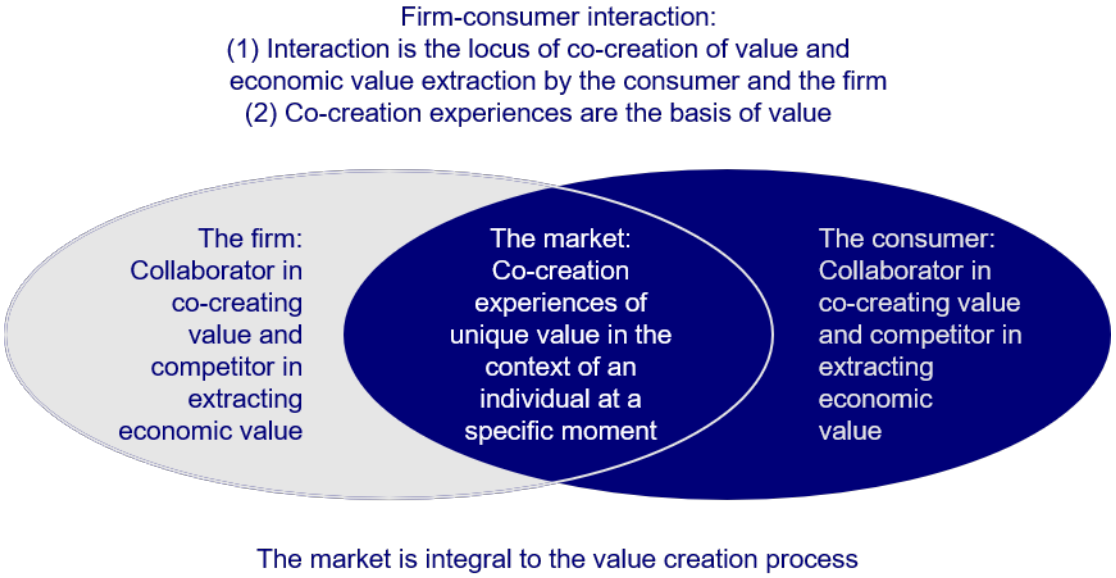
Figure 4. Customer value co-creation activities



Source: Ercsey (2016.29), grey and blue shades are own elaboration.

Notwithstanding, customer interaction with other customers during customer value co-creation generates a dialogue that transforms the market into a forum. In the long term, a new experience-based approach to the market will emerge that would transform the market into a forum for dialogue amongst customers, firms and communities of customers and networks of firms (Prahalad & Ramaswamy, 2004b). Figure 5 shows a condensed description of some of the critical components of the emerging concept of the market in Prahalad & Ramaswamy (2004b).

Figure 5. The emerging concept of the market



Source: Prahalad & Ramaswamy (2004b:11), grey and blue shades are own elaborations.

We claim that the definitions of customer value co-creation behaviour by Yi & Gong (2013, 2011) and by Yi, Gong, & Lee (2013) are the more suitable for service ecosystems, since they consider value-in-use and shift the focus towards the contextual and the experiential quality of value co-creation behaviour. Furthermore, we adopt the operational definition of customer value co-creation behaviour proposed by Ercsey (2016) for unplanned and voluntary usage. Indeed, this definition supports Yi *et al.*'s (2013, 2011) and Yi, Gong, & Lee's (2013) notion that customer value co-creation behaviour is a multidimensional concept that consist of two higher-order constructs: the extra-role of customer citizenship behaviour and the intra-role of customer participation behaviour. Customer citizenship behaviour is the voluntary and optional behaviour not required for the service exchange, but to help the overall customer experience and the organisation of the service, while customer participation behaviour is the predictable and necessary behaviour for the production, delivery and exchange of services amongst customers (Groth, 2005; Bove *et al.*, 2003; Yi & Gong, 2008).

We suggest that under the service-dominant logic, customer value co-creation behaviour is the interplay between the external (extra) and the internal (intra) roles of users that participate in hedonic SNSs, like Instagram. The external (citizenship) role is affected by the unplanned and voluntary usage (Dong & Sivakumar, 2017) of hedonic SNSs and can promote increased advocacy levels. The internal (participation) role is mediated by the users' perception of the interaction between actors of a network that leads to resource integration of customers' resources[29].

2.7.3. Dimensions of customer value co-creation behaviour

Operationalisation is the methodical practice of an operational definition; operationalisation defines the most basic concepts using the steps required to measure them. For example, the

[29] Under the service-dominant logic, several scholars (Bove, Pervan, Beatty, & Shiu, 2009; Groth, 2005; Yi & Gong, 2008; Nataraajan & Gong, 2011) supported Yi *et al.* (2013, 2011) in the definition of the intra- and extra-roles of value co-creation.

operationalisation of customer value co-creation behaviour comprises two different concepts: customer participation behaviour and customer citizenship behaviour (Yi & Gong, 2013). We use Yi & Gong's (2013) operationalisation of customer value co-creation behaviour to study how interactivity mediates in the relationship between customer citizenship behaviour and customer participation behaviour in hedonic SNSs, like Instagram.

Yi & Gong (2013) discussed how the measurement scales: (1) fit with the various descriptions of value developed under the service-dominant logic; (2) are conceptually sound and psychometrically reliable; and (3) are consistent, reliable and nomologically valid. We, therefore, adopt Yi & Gong's operationalisation of customer value co-creation behaviour to study the empirical relation between value co-creation and interactivity in hedonic SNSs, like Instagram. Also, Yi & Gong's (2013) value co-creation behaviour's scale is the most empirically tested to date by scholars in a diversity of countries and environments, to ensure its validity and reliability.

Yi & Gong (2013) argued that co-creation could originate in two different types of customer behaviour: citizenship and participatory. During value co-creation experiences (Galvagno & Dalli, 2014; Ind & Coates, 2013; Ranjan & Read, 2014; Yi & Gong, 2013), customer citizenship behaviour and customer participation behaviour are seen to follow different behavioural paths and to have specific antecedents and consequences (Blasco-Arcas, Hernández-Ortega, & Jiménez-Martínez, 2014b; Cheng, Luo, Yen, & Yang, 2016; Ercsey, 2016; Groth, 2005; Kelley, Donnelly, & Skinner, 1990; Moreno de García & Calderón, 2017; Morrison, 1993; Yi *et al*., 2011)

1. Citizenship behaviour has a higher value for organisations because it is performed voluntary, and through it, customers contribute to value co-creation and use relationships to improve the service. Examples of this are: (1) recommending the company to other people; (2) showing willingness to help and assist to other customers; (3) or tolerating non-compliance (breaches) with the service when the brand does not respond quickly to their interest or does not provide what they need, want or expect (Yi & Gong, 2013; Silva *et al*., 2016). In addition, customers freely perform activities that support the joint co-creation of value, such as feedback and defence.

2. Participatory behaviour is determined by the common and necessary actions carried out by customers and through which they become an active part in the co-creation of value (Groth, 2005). Participatory behaviour emerges when the customer accepts and follows the suggestions or instructions of other customers, they are in contact with or personally interact with the people in the service delivery (Yi & Gong, 2013; Silva, *et al*., 2016). Participatory behaviour includes the performance of critical customer activities for the joint creation of value, such as co-production (Ranjan & Read, 2014), co-design (Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010; Füller, Mühlbacher, Matzler, & Jawecki, 2009), and co-delivery. Thus, customers use their skills and knowledge to improve service.

In our doctoral research, we study the factors that influence customer's commitment to value creation, taking into account the two phases: firstly, the support phase (i.e., customer citizenship behaviour) and secondly, the co-production and co-delivery phase (i.e., customer participation behaviour). Accordingly, we consider that the construct of value co-creation behaviour involves social influences and experiential value (Yi & Gong, 2013):

1. Customer citizenship behaviour entails support (Bidar *et al*., 2016), voluntary behaviour (Encinas-Orozco & Cavazos-Arroyo, 2016) and freedom of choice (Bettencourt & Brown, 1997). It implies acts of cooperation, help, and kindness (Lengnick-Hall, Claycomb & Inks,

2000) that are not necessarily aimed at creating or successfully delivering the service (Groth, 2005). Shamim & Ghazali (2014) argued that social influence moderates the link between experiential value[30] and customer value co-creation behaviour. Customers who adopt citizenship behaviour tend to disseminate positive word of mouth (WOM), purchase more services, and readily accept price increases (Anderson, Fornell, & Mazvancheryl, 2004; Bettencourt & Brown, 1997).

2. Blasco-Arcas *et al*. (2013) argued that customer participation behaviour in value co-creation is a source of competitive advantage that generates customer engagement and helps to build a positive relationship with the organisation and other customers. Bidar *et al*. (2016) defended that customer participation behaviour comprises co-production, co-design and co-delivery when users use their skills and knowledge. Higgins *et al.* (2009), Hirschman & Holbrook (1982) and Holbrook (1994) characterised value as experiential. Since there is no physical presence on the internet, new features are needed to facilitate customer involvement (Carbonell-Foulquiao, Rodríguez-Escudero, & Pujari, 2008) in value co-creation through participation, such as personalisation and interactivity to generate value.

Bettencourt (1997) was the first author to postulate the relationship between customer citizenship behaviour and customer participation behaviour[31], particularly with the dimension of responsible behaviour. This is due to firm support having a positive effect on cooperation and customer participation.

In the context of the service co-creation process under the service-dominant logic, Bidar *et al.* (2016) noted the mutual influence of customer citizenship behaviour and customer participation behaviour. These authors argued that: (1) customer citizenship behaviour is comprised of supportive activities such as feedback and defence; (2) social influence is a dimension of customer citizenship behaviour; and (3) experimental value is a dimension of customer participation behaviour; In fact, social influence of actors in a network is a recommendation process, since *'people prefer the intuitive option to the externally recommended option under limited resource conditions, but prefer the recommended option under a non-limited resource condition'* (Kim, Kim, & Marshall, 2020), and service ecosystems operate under non-limited resource condition. Therefore, the social position of actors within a network is a good indicator of their social influence, which in turn depends on recommendations[32] (Koohborfardhaghighi & Kim, 2013).

[30] Some scholars (Bagozzi & Dholakia, 2002; Bidar *et al*., 2016; Tsai & Bagozzi, 2014) argued that social influence, that is compliance (subjective norm), internalisation (group norm) and identification (social identity) predict participation in online communities (continuance intention). Li (2011) argued that internalisation (group norm) levels are lower than identification (social identity) and compliance (subjective norm) when social influence leads to continuance intention (Cheung & Lee, 2010).

[31] Previous research studied these two phases separately, without considering their mutual impact. For example, research on the co-production and co-delivery phases includes authors such as Hoyer, Chandy, Dorotic, Krafft, & Singh (2010) and Fuller, Mühlbacher, Mätzler & Jawecki (2009), while studies on the support phase have been described in our research, such as Yi & Gong (2013). Bidar *et al*. (2016) jointly considered the co-production and the co-delivery phases (i.e. customer participation behaviour) and the support phase (i.e. customer citizenship behaviour) that affects customer engagement during value co-creation. Shamim & Ghazali (2014) identified two dimensions: the experimental value of customer participation behaviour and the social influence of customer citizenship behaviour which positively impact the development of the retail business.

[32] The dimension of recommendation is the operationalisation of social influence due to the actor's position in a network of users: *'Social networks are social structures that depict relational structure of different entities. The most important entities are usually located in strategic locations within the network. Users from such positions play important roles in spreading the information. The purpose of this research is to make a connection between, information related to structural positions of entities and individuals advice selection criteria in a friendship or trust network. We explore a technique used network to consider both frequency of interactions and social influence of the users. We show, in our model, that individual positions*

In addition, it has been shown that customer participation behaviour and customer citizenship behaviour negatively affect turnover intention, that is, the probability that a company's customer base is transferred to other companies (Revilla-Camacho, Vega-Vázquez, & Cossío-Silva, 2015; Yi *et al.*, 2011). Therefore, customer participation behaviour improves retention by consolidating the relationship between the customer and the firm and increasing business profitability by establishing a lasting relationship between the customer and the company[33].

2.7.4. Conceptualisation of customer citizenship behaviour

The construct of customer citizenship behaviour is typically a function of people's education, civics, and social and political life (Groth, 2005; Bove *et al.,* 2009; Saren *et al.*, 2007). However, the concept has been adapted to characterise the customers who contribute voluntarily to a firm or a brand through acts of service by adding value to other users and improving the firm's quality, efficiency, and reputation (Elbedweihy, 2014). In addition, customer citizenship behaviour is also a function of the synergetic relationship (Meynhardt *et al.*, 2016) between interacting actors (Chen, Hsieh, Chang, & Chen, 2015).

Bettencourt & Brown (1997) asserted that customer citizenship behaviour is discretionary and voluntary. Lengnick-Hall, Claycomb, & Inks (2000) claimed that customer citizenship behaviour involves altruism, empathy and support. Anderson, Fornell, & Mazvancheryl (2004) and Bettencourt & Brown (1997) argued that customer citizenship behaviour leads to positive WOM, purchase of additional services, and higher tolerance to prices. Wilhelm (2014) maintained that customer citizenship behaviour is a function of public and civic behaviour, whereas Groth (2005) stated that customer citizenship behaviour refers to a voluntary behaviour of the customer who benefits the business.

Customer citizenship behaviour has been linked to users' perceived personalisation and playfulness (Elbedweihy, 2014), connectedness (Ponnusamy & Ho, 2015; Tung, Chen, & Schuckert, 2017) and responsiveness (Bove, Pervan, Beatty, & Shiu, 2009; Saren, Maclaran, Goulding, Elliott, & Shankar, 2007) all of which are social facets of interactivity.

2.7.5. Dimensions of customer citizenship behaviour

We conceive customer citizenship behaviour as a multidimensional construct. To do so, we adopt the four dimensions proposed and tested by Yi *et al.*'s (2013, 2011) and Yi, Gong, & Lee (2013) (i.e., tolerance, helping, defence and feedback), to which we add recommendation (Groth, 2005). In addition, we suggest splitting the component feedback into solicited feedback and unsolicited feedback. Based on the extant literature, we conceptually define each dimension in the following paragraphs.

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within a network structure can be treated as a useful source of information in a ***recommendation*** [emphasis added] *exchange process'* (Koohborfardhaghighi & Kim, 2013:255).

[33] Turnover and retention show opposite trends, since customer turnover is the proportion of customers who leave during a period (approximately a year), while retention is the proportion of customers that stay within the same period. In the health and beauty sector, customer participation behaviour and customer citizenship behaviour are negatively related to customer turnover intention; the more customer loyalty, the better the profitability levels (Revilla-Camacho, Vega-Vázquez, & Cossío-Silva, 2015). Therefore, a firm can retain its customer base and profit based on customer participation behaviour and customer citizenship behaviour (Yi *et al.*, 2011).

- Unsolicited feedback translates into unsolicited information given to other users in the form of a statement or an opinion; this helps develop the process of service creation (Bettencourt, 1997). Customers make suggestions to other customers based on their previous experiences with the service; therefore, users became experts as more experienced customers (Walsh, Groth, & Wiedmann, 2005). Providing unsolicited feedback is generally an extra-role behaviour and is appreciated by other customers, since it significantly improves the value co-creation process (Ercsey, 2016).

- Solicited feedback is described as the planned reaction of customers to the service provider that seeks help to accomplish the service (Groth, 2005; Yi & Gong, 2013); feedback increases the perception of value-in-use due to the simplicity of the review writing process and encourages the use of the brand (Rubio *et al.*, 2019). In addition, solicited feedback provides information to the business employees and helps to improve creation during the service process (Ercsey, 2016); since customers have experienced the service, customers become experts and can offer ideas to employees as part of their extra-role (Groth, Mertens, & Murphy, 2005).

- Defence means publicly supporting the service received to colleagues, friends and relatives (Bettencourt, 1997). Defence is associated with the friendly and confident endorsement of individuals in a network of customers (Yi & Gong, 2013; Seiling, 2008). Customers can exchange their opinions and experiences with their peers, relatives and co-workers. According to their interests, users enrol in communities to contribute with their experiences and insights. Defence reinforces positive or negative reactions amongst customers. As a result, customers can strengthen or weaken the relationship with other customers and the service provider.

  Previous research has linked defence to motivation (Lawer & Knox, 2006) and loyalty (Butcher, Sparks, & O'Callaghan, 2001). In value co-creation, defence is optional (2013) and very useful (Walsh *et al.*, 2005). Furthermore, positive defence levels towards other customers or brands and their values (Rafaeli, 1988; Rafaeli & Sudweeks, 1997) reflects similar values in customers that speak highly of other customers or brands (Mahoney, 1999; Prahalad & Ramaswamy, 2004a).

- Helping refers to the assistance to other customers during the course of service. Unlike the roles played by the service provider, the roles of customers are less defined, even though they spontaneously might help other customers (Groth *et al*., 2005). Ercsey (2016) argued that helping is a service directed at other customers during value co-creation. Since the roles of customers are not scripted, the behaviour of customers directed at helping others exchange knowledge is always voluntary and unplanned (Walsh *et al*., 2005) and reinforces the construction of a network of users.

  Rosenbaum & Massiah (2007) claimed that customers evoke their past experiences to assist others with similar difficulties. Customers can remember and use past challenging events and show social responsibility to other users who experience the same problems (Rosenbaum & Massiah, 2007).

- Tolerance requires customers to be predisposed to accept that the service does not meet their requirements on other actors for his or her correct service, such as in service disruptions or lack of service. Tolerance is described as the willingness of customers to persevere in the event of a gap between the expectation of the customer and the service

delivery (Lengnick-Hall, Claycomb, & Inks, 2000). Customers complain or repudiate service delivery altogether if the service gap is more significant than their tolerance level; tolerance is labelled the zone of tolerance or the threshold of complaining (Tronvoll, 2007). The failure of a service encounter is the primary source of customer's turnover intention (Yi *et al.*, 2013, 2011) since this failure obstructs customers from constructing networks with the providers of services and other customers.

Lengnick-Hall (1996) argued that tolerance means that customers lower their expectations during incorrect service delivery. Keaveney (1995) stated that since service failure is the second reason for customer turnover, tolerance can help maintain its customer base and success. Furthermore, because failed service encounter is the second reason customers change behaviour, reducing the organisation's market share and increasing customer tolerance helps the organisation improve its customer base.

- Recommendation refers to customers that speak highly of the service to other customers, usually friends or family. It promotes a positive brand image, goods and services, and it increases the customer base of a business or brand. This behaviour indicates the commitment and sponsorship (Bettencourt, 1997) and the predicted behaviour of acquaintances, friends and family members who follow the recommendation. Customers voluntarily engage in recommendation (Groth, 2005). Moreover, social influence generates mental models (Edvardsson *et al.*, 2011; Vink, Edvardsson, Wetter-Edman, & Tronvoll, 2019) of other users' behaviour that becomes fixed roles that can help predict other users' behaviour (Bidar, Watson, & Barros, 2016). Recommendation can, directly and indirectly, impact other users through C2C interactions (Giuffre, 2013; Edvardsson *et al.*, 2011) and membership in hedonic SNSs (Bidar, Watson, & Barros, 2016).

2.7.6. Conceptualisation of customer participation behaviour

The construct of customer participation behaviour has been defined as the mental, physical and emotional energy (and contribution) that customers put into the provision of a service (Ennew & Binks, 1999; Onofrei, Hunt, Siemienczuk, Touchette, & Middleton, 2004). According to the service-dominant logic, customer participation behaviour is based on the actor's cognition and individual behaviour.

Customer participation behaviour entails the use of the operant resources that customers possess (skills, knowledge and relationships) for the integration of other resources; their interactional qualities include aspects of interpersonal interactivity, such as kindness and respect (Blasco-Arcas, Hernandez-Ortega, & Jiménez-Martínez, 2013).

Blasco-Arcas *et al.* (2013) argued that customer participation behaviour in value co-creation is a source of business competence, greater customer participation and meaningful relationships with the firm (Firat & Venkatesh, 1993; Prahalad & Ramaswamy, 2004; Vargo, 2008; Vargo & Lusch, 2004; Vargo, Maglio, & Akaka, 2008). This perspective derives from the study of value as experientially determined (Higgins. *et al.*, 2009; Hirschman & Holbrook, 1982; Holbrook, 1994), which is particularly relevant for online environments – where there are no physical manifestations and other tools are needed to persuade the customer to participate in value co-creation.

Our conceptualisation of customer participation behaviour is derived from the consideration that the value is perceived by customers (Prebensen & Xie, 2017) as explicated in the social

construction theory and social capital theory (Lefebvre *et al.*, 2016), and is determined by the service encounter (Higgins & Scholer, 2009; Hirschman & Holbrook, 1982; Holbrook, 1994). Customer participation behaviour helps firms and brands maintain their customer base and achieve greater profitability levels (Ercsey, 2016). Firstly, the costs of losing customers remain high. Secondly, the longer the relationship between organisations and customers, the greater the present value (Revilla-Camacho *et al.*, 2015). These authors suggested that customer participation behaviour strengthens the firm's relationship with customers on a lifelong basis, so that businesses can increase their profitability.

2.7.7. Dimensions of customer participation behaviour

According to Yi *et al.* (2013, 2011) and Yi, Gong, & Lee (2013), customer participation behaviour has four dimensions: information seeking, information sharing, responsible behaviour and personal intention.

We adopt this view and, based on the extant literature, and we define these dimensions in the following ways:

- Information seeking involves customers' search for evidence to clarify service needs and wants and fulfil the service's cognitive requirements. Customers seek information on the nature of the service and the parameters during service exchanges with other users (Kellogg, Youngdahl, & Bowen 1997). In addition, they require information on what tasks they should accomplish, how to complete tasks (Onofrei *et al.*, 2004; Silpakit & Fisk, 1985), how to act during service exchanges, and their role as customers during value co-creation (Kelley, Donnelly, & Skinner, 1990; Kellogg *et al*., 1997).

  Customers need to identify what to do and how to fulfil service requirements during service exchanges based on other users' opinions. Information seeking fulfils this need and lets them gain cognitive benefits (Hoyer *et al.*, 2010; Nambisan & Baron, 2009; Bidar, Watson, & Barros, 2016); also, it reduces ambiguity and anxiety, and it helps customers to comprehend and control the conditions during joint co-creation.

- Information sharing refers to the exchange of essential information with other customers; customers do what it is expected of them to guarantee the quality of value co-creation (Ennew & Binks, 1999; Bettencourt, 1997). Accurate information provided by customers and shared with other users and employees gives access to resources for optimal value co-creation, for example, how to use customers' own data in the process of value co-creation (Lengnick-Hall, 1996). In this way, customers ensure that other users and employees offer the particular service that fulfils their expectations (Ennew & Binks, 1999). Customers need to share information with employees and other users, so that everyone can perform their roles and duties during successful value co-creation (Ennew & Binks, 1999).

  Therefore, while information seeking is merely an enabler, information sharing is critical to the realisation of value co-creation. It is the responsibility of users to give accurate information about their personal and contextual data, such as tastes, conditions, preferences, attitudes, desires and living standards, so that other users can make adequate diagnoses, evaluations and appraisals of the service encounter. Furthermore, customers help disseminate the reputation and care of others through shared experiences

(Romero & Molina, 2011) that characterise the ability to socialise and their disposition to behave as good customers (Bidar, Watson, & Barros, 2016).

- Responsible behaviour requires a customer behavioural response accountable for the customer; it occurs when customers recognise their role and responsibility and accountability for the outcomes as part of an organisation, group, or even partial employees (Ennew & Binks, 1999). Responsible behaviour means that customers identify their responsibility and obligations and the need to cooperate and receive instructions from other customers to achieve value co-creation (Bettencourt, 1997; Ercsey, 2016). Bettencourt (1997) argued that customers recognize their obligations and commitments as partial employees in value co-creation).

  Customers' responsible behaviour increases the probabilities of value co-creation during the service encounter. This entails cooperation, observation of the implicit and explicit rules, acceptance of service policies; customers accept the advice and the proposed instructions from other customers or even employees for positive value co-creation (Bettencourt, 1997). Customers must be present during the service encounter; in hedonic SNSs, like Instagram, feelings of remote presence (telepresence) are coupled with feelings of being in the virtual environment with other customers or employees (social presence) for an efficient and effective value co-creation.

- Personal intention represents the interpersonal relationships between customers required for effective value co-creation (Ennew & Binks, 1999). The term *'customer functional quality'* (Kelley, Donnelly, & Skinner, 1990:323) refers to reciprocal, intercommunicative and synergistic aspects, such as respect, kindness and civility (Ennew & Binks, 1999; Kelley, Donnelly, & Skinner, 1990). Personal intention requires courtesy, friendliness and respect (Kelley, Donnelly, & Skinner, 1990; Ennew & Binks, 1999). Personal intention between users who communicate through chat rooms generates positive word-of-mouth (Novak, Hoffman, & Yung, 2000) and facilitates customer service and supply chain management (Berthon, Holbrook, & Hulbert, 2000; Lusch, 2011; Peltier, Schibrowsky, & Davis, 1998).

  Given that the context of value co-creation in hedonic SNSs, like Instagram, is a social environment in which services are carried out, it is easier for customers to engage in value co-creation when the social context is more pleasant, congenial and positive (Walsh, Groth, & Wiedmann, 2005). Thus, the service's positive social environment impacts user participation in value co-creation (Lengnick-Hall, 1996). In addition, personal intention in hedonic SNSs like Instagram requires using a medium (or media) to communicate or relate to other users instead of the 'interactive use' during personal face-to-face communication (Kelley, Donnelly, & Skinner, 1990:323).

2.8. Theoretical accounts of interactivity

In spite of the significance of the concept of interactivity, there is no agreement on neither the definition of interactivity nor its dimensions (Coursaris & Sung, 2012; Downes & McMillan, 2000; Johnson, Bruner II, & Kumar, 2006; Kiousis, 2002; Ko, Cho & Roberts, 2005; Liu & Shrum, 2002; Lombard & Snyder-Duch, 2001; McMillan & Hwang, 2002; Rafaeli, 1988; Sohn, 2011). A search in ISI Web of Knowledge in 29th January 2021, showed 87 articles that address the concept of

customer interactivity in digital media but little agreement on the nature and the domain of interactivity (see Table 3).

Table 3. The selected pool of definitions of interactivity

Author	Definition or description of interactivity
(Steuer, 1992:84)	*'The extent to which users can modify the form and content of a mediated environment in real-time'*
(Rafaeli & Sudweeks, 1997:3)	*'The extent to which message in a sequence relate to each other, and especially the extent to which the last message recount the relatedness of earlier message'*
(Wagner, 1997:20)	*'the attributes of the technology systems employed'*
(Liu & Shrum, 2002:55)	*'the hardwired opportunity (…) provided during an interaction'*
(Sawhney, Verona & Prandelli, 2005:3)	*'…the Internet increases the flexibility of customer (…) level of involvement over time and across sessions'*
(Thorson & Rodgers 2006:36)	*'the extent to which users perceive their experience as a simulation of interpersonal interaction and sense they are in the presence of a social other'*
(Wu, 2006:91)	*'a psychological state experienced by a (…) user'*
(Wu, Hu & Wu, 2010:1)	*'an interpersonal-based antecedent, disposition to trust as a personality-based antecedent, and perceived Web assurance as an institution-based antecedent to initial online trust'*
(Murschetz, 2011b:389)	*'(a) mutually interdependent social action between individuals who exchange symbols and meanings in the communication process which itself is supposed to be sequential, that is actions of one person result in reactions of another person'*
(Kirk & Swain, 2013:464)	*'a cognitive (process) analogue of touching, manipulating, and customizing a product'*
(Ariel & Avidar, 2015:24)	*'a process-related variable, where(as) the transmission of information is in the center of the interaction (...) – In our view, interactivity is not an inherent attribute of a medium that is defined by its technological characteristics. Rather, interactivity might be found in both new and traditional media settings, because interactivity is an attribute of the process of communication itself. In other words, although technological characteristics of new media help to break down the traditional differentiation between mass and interpersonal communication, new media is not necessarily more interactive than traditional media; rather, it enables interactivity ('enabled interactivity'). Hence, a face-to-face conversation might also be interactive, according to the type of message it conveys'*
(Alves, Ferreira & Fernandes, 2016b:3)	*'interactivity (…) reflects the individual perception as to their capacities to organise and implement specific actions that lead to certain levels of results (…) persons displaying higher levels of perceived interactivity opt to undertake more challenging tasks and demonstrate their abilities in exploring and exploiting challenges in the surrounding environment'*
(Rodríguez-Ardura & Meseguer-Artola, 2016a:505)	*'the extent to which the e-learners perceive that their communication or interaction in the virtual education environment is bi-directional, responsive to their actions and controllable'*

Source: own source.

Not surprisingly, Murschetz (2011) claimed that the definitions of interactivity, its units, its levels of analysis, and especially the loci of interactivity were largely inconsistent. Murschetz (2011) argued that scholars were unable to theoretically explain the relationships between the different facets of interactivity.

Mollen & Wilson (2010) argued that there are two approaches to interactivity, one that is structural or mechanistic (Liu & Shrum, 2002) and another that is experiential and perceptual (McMillan & Hwang, 2002). The structuralist perspective views interactivity as a reaction to the properties of the online medium. In contrast, the experiential perspective understands interactivity as a psychological manifestation produced by the interaction of users with the online content and the cognitive processes involved (Wu, 2006). In addition, Mollen & Wilson (2010) pointed out that there is no relation between the delivery of interactive characteristics of digital content and the perceived interactivity of users. What is more, they defend that interactivity occasionally has a negative effect[34] on customers when it generates an unjustified demand of users' cognition and knowledge (Liu & Shrum, 2005; Jin, Cardoso, & Verbert, 2017).

Wu (2006) was the first scholar who addressed the multilevel and multifaceted nature of interactivity and proposed a general taxonomy composed of two separate, but interconnected constructs: (1) the interaction and response with the network of the user; and (2) the user's individual participation as an online communicator.

- The interaction and response with the network of users, also known as user's network interactivity (Rafaeli, 1988), refers to generating conversations amongst the audience (Rafaeli, 1988). This facet of interactivity is instrumental and is related to the social aspects of value creation in brand communities (Edvardsson, Tronvoll, & Gruber, 2011; Muñiz & O'Guinn, 2001; Schau, Muñiz, & Arnould, 2009). Herein, interactivity generates experiential and functional value (Fiore, Jin, & Kim, 2005) and its bi-directional quality promotes the hedonic creation of value for online consumers (Yoo, Lee, & Park, 2010).

- The individual telepresence and synchronous participation of an individual who communicates online is also known as the user's perceived interactivity (Steuer, 1992), and it relates to the user's subjective experience (Newhagen, Cordes, & Levy, 1995; Shneiderman, 1998; Wu, 2000). More specifically, it refers to the degree of the redesign of a virtual environment in which the individual user can exchange messages and communicate synchronously and asynchronously with other users (McMillan & Hwang, 2002).

Some authors (Aoki, 2011; Mollen & Wilson, 2010; Sundar, Kalyanaraman, & Brown, 2003; Zafiropoulos, Vrana, & Karystinaiou, 2007) followed the same reasoning as Wu (2006). For example, Zafiropoulos, Vrana, & Karystinaiou (2007) defended that interactivity can be both a property of the interpersonal communication process in a medium (Ha & James, 1998; Heeter, 2000; Miles, 1992; Pavlik, 1996; Rafaeli, 1988) and a property of the perceived use of the medium (Lombard & Snyder-Duch, 2001; Mayer & Jensen, 1999; McMillan, 1999; Sohn, Leckenby, & Jee, 2003; Gonzales, Finley, & Duncan, 2009; Sohn *et al.*, 2003).

[34] McMillan & Hwang (2002) and Song & Zinkhan (2008) pointed out that the addition of interactive features on a website does not guarantee the positive perception of interactivity by users. In fact, in some cases adding more interactive features to a website can have a detrimental effect on customers, since customers are reluctant to levels of interactive behaviour beyond their cognitive processes due to cognitive absorption (Balakrishnan & Dwivedi, 2021). In other words, interactivity occasionally has a negative effect on customers when interactivity levels generate an unjustified demand of user's cognition and knowledge (Liu & Shrum, 2005).

Therefore, for these authors (Zafiropoulos, Vrana, & Karystinaiou, 2007) two types of interactivity exist: the first type focuses on the interpersonal communication process, whereas the second refers to a property of the digital medium and the perception of such a property by the user[35].

By their part, Mollen & Wilson (2010) stated that, although there is no unanimously accepted definition of interactivity, most researchers tend to focus on the process of communication between two parties and the users' capability to modify the digital environment (and the content) during the communication, which emphasises the dimensions of two-way communication and control-ease of use.

In line with Wu (2006), Sundar *et al.* (2003) stated that interactivity is positively related to emotional traits, such as the level of liking of brand content (Ahern & Stromer-Galley, 2000) or the degree of like-mindedness. Therefore, they asserted that there is an emotional advantage in increasing the interactivity of a website. Also, they offered empirical evidence of interactivity for opportunistic and functional activities. In addition to this, scholars who used a *'contingency-based operationalisation'* conceived interactivity as a characteristic of the message (Sundar, Kalyanaraman, & Brown, 2003:31), while researchers who adopt a function-based operationalisation approached considered interactivity as a feature of the medium[36].

In a discussion about interactivity that took place at the 2004 Conference of the American Marketing Association (Bernhardt, Boles, & Ellen, 2004), academics distinguished between the different views of Rafaeli (1992) and Steuer (1988). Following this same line of thought, Song & Zinkhan (2008) compared Steuer's (1999) telepresence theory with Rafaeli's (1988) interaction theory and declared that both are foundational in the understanding of interactivity:

- Interactivity theory is grounded on the belief that interactivity depends on the exchange of messages; therefore, communication characteristics (reciprocity, responses, content) affect users' perception of interaction with other users; it postulates that interactivity is a function of the exchange of messages. According to this theory, the extent of the interactivity lies in the reciprocity of a particular exchange of messages that positively affects the users' efficiency during their immersive experiences in a virtual environment.

- Telepresence theory claims that information is mediated and recreated by the virtual environment, due to the properties of the medium and the user's perception of the medium. This theory establishes that the relevant properties of the online medium are speed and range, and that interactivity emerges from the relationship between the user and the medium.

Accordingly, from now we take into account both theories and differentiate between the interactivity that appears on the trails of messages, or network interactivity (Rafaeli, 1988), and the perceived interactivity in the communication medium (Steuer, 1992). This is in line with Sundar *et*

[35] Zafiropoulos, Vrana, & Karystinaiou (2007) argued that there are three perspectives of interactivity in the electronic medium: (1) the medium of a website that focuses on general characteristics such as two-way communication, or specific characteristics such as search engines (McMillan & Hwang, 2002), this equates user's actual interactivity; (2) communication processes that focus on exchange and responsiveness (Rafaeli, 1988), this equates user's network interactivity (Rafaeli, 1988); and (3) user's subjective perception of interactivity, this equates user's perceived interactivity (Steuer, 1992).

[36] Sundar *et al.* (2003) empirically demonstrated the distinction between interactivity as a contingency-based operationalisation (message) and as a function-based operationalisation (medium). In fact, the message versus the medium, therefore we postulate in this thesis that the message precedes the medium of communication.

al. (2003) and Leiner & Quiring (2008), who proposed to conclude the debate on interactivity in this manner.

2.8.1. Social and psychological components of interactivity

The difficulty of defining interactivity steams from its high face validity and intuitive appeal, but little consensus achieved on its meaning and its actual role (Rafaeli, 1988). In addition, we identified a research gap in the literature of interactivity between the social factors that influence users that interact with other users (producing what we call *network interactivity*) (Zhao & Lu, 2012) and the psychological mechanisms that operate in users who perceive interactivity. We bridge this gap in two ways.

Firstly, we organise interactivity's social and psychological components in a rational and meaningful way into the constructs of network interactivity (Rafaeli, 1988; Rafaeli & Sudweeks, 1997) and perceived interactivity (Steuer, 1992). Also, under the service-dominant logic, we will consider a potential connection between these two constructs.

Secondly, we develop a theoretical nexus[37] between interactivity and value co-creation (Murschetz, 2011) through the integration of customers' operant resources (Lusch & Vargo, 2006). Then, we study the integration of customers' operant resources (Singaraju *et al.*, 2016) in hedonic SNSs, like Instagram, by taking into consideration: (1) the main attributes and the properties of network and perceived interactivity; (2) the social media context (Chen & Vargo, 2010), where the operant resources of skills, knowledge and relationships amongst users reside; and (3) the ability of network and perceived interactivity to mediate during customer value co-creation behaviour in the context of a *'socio-material configuration'* (Ramaswamy & Ozcan, 2018:196) of a service ecosystem.

A review of extant research shows that almost every operational definition of interactivity includes a unique combination of social and psychological components. As a result, a broad spectrum of facets of interactivity has been considered. However, some common elements can be identified:

a) Some scholars characterised interactivity as containing only social explanatory factors (McMillan & Hwang, 2002; Wu, 1999; Leiner & Quiring, 2008), such as perceived personalisation (earlier known as direction of communication), playfulness, connectedness and responsiveness.

b) Other scholars considered only the psychological facets of interactivity (Mollen & Wilson, 2010; Voorveld & Reijmersdal, 2012; Voorveld *et al.*, 2011), including, for example: perceived two-way communication, or give-and-take exchange of ideas within the group of referral; perceived receptiveness (synchronistic time replies); and perceived control (i.e. user's ability to influence the medium of communication).

[37] Under the service-dominant logic, interactivity has several benefits during the value co-creation process. Nambisan & Baron (2009) argued that interactivity has learning (Te'eni, 2001; Clark & Brennan, 2004; Dennis & Kinney, 1998; Hsu, 1996), social integrative (Shannon & Weaver, 1949; Burgoon, Bonito, Benston, Ludenberg, & Allspach, 2000; Rafaeli & Sudweeks, 2006), hedonic benefits (Burgoon, Bonito, Bengston, Ludenberg, & Allspach, 2000) and mind amplification, that is how to stimulate creative thoughts (Durlak, 1987).

c) A number of scholars considered that interactivity combines a range of social and psychological components (Zhao & Lu, 2012), including control, playfulness, connectedness, and responsiveness (Rodriguez-Ardura & Meseguer-Artola, 2016a).

We propose separating the social and psychological facets of interactivity and dividing them into two independent constructs: network interactivity and perceived interactivity. Based on this distinction, we will later explore the synergetic role (Meynhardt *et al.*, 2016) that interactivity (Kristof & Satran, 1995) plays as a driver of value co-creation (Yi & Gong, 2013; Yi, Nataraajan, & Gong, 2011) when users integrate operant resources during actor-to-actor processes that have network interactivity and perceived interactivity (Nenonen & Storbacka, 2009).

2.8.2. Conceptualisation of interactivity

We conceive interactivity in hedonic SNSs, like Instagram, not as an external characteristic of the digital media with deterministic control in the technical implementation, handling, and functioning, but as a result of the interplay between the service ecosystem, the digital technology, and human-computer interaction (MacKenzie & Wajcman, 1999; Thomas, 1995; Williams & Edge, 1996).

Based on our integrative view of the interactivity theory and telepresence theory, we propose that interactivity is the degree to which users are willing to exchange messages, act on other users, and can modify the communication medium. Also, we claim that interactivity is multidimensional in nature and can be split into two constructs: network interactivity, as described by Rafaeli & Sudweeks (1997) and Rafaeli (1988); and perceived interactivity, as defined by Steuer (1992). In addition, we propose that network interactivity precedes perceived interactivity within the interactive process that leads to the integration of resources (Ballantyne & Varey, 2006; Fyrberg & Jüriado, 2009).

Peters (2016) identified two types of resource integration: (1) homeopathic integrations, which result from additive and cumulative integration processes and summative relationships between resources; and (2) heteropathic resource integrations, which are transformational and lead to new emergent properties (Meynhardt *et al.*, 2016; Peters, 2016) and new patterns (Arthur, 2013) that actors perceive as valuable[38].

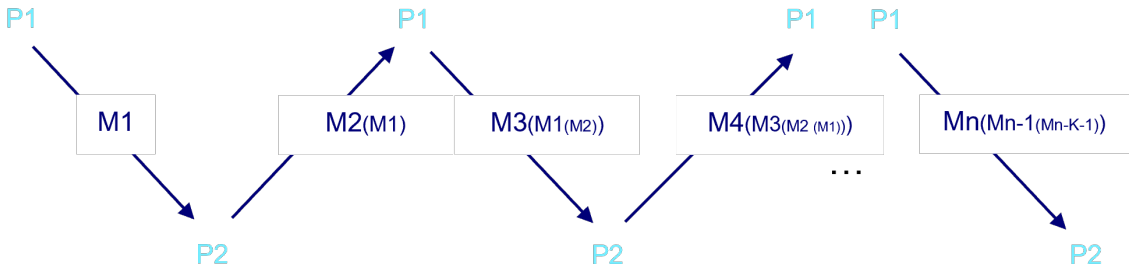
A network (or group) of resource integration patterns – designed or emergent – is called a *choreography,* when it encapsulates the process of interactivity that generates the expected effects by users (Peters, 2016). A choreography materialises in an architectural framework that describes the actor's interactivity and includes several patterns of interaction. It determines how the different actors interact during the exchange and the design of services in a service ecosystem, assuming that no particular actor controls the process (Benghazi, Noguera, Rodriguez-Dominguez, Pelegrina, & Garrido, 2010; Peltz, 2003). Also, a choreography defines the wealth and richness of the spatial and temporal relationships between the patterns of interaction due to the different architectural routes that interconnect multiple hubs, centres, events or environments.

[38] Under the service-dominant logic, value is phenomenologically determined and it is related to the way in which real events are monitored (that is, dependent) on our perceptions of the world. Therefore, value is related not only to what emerges from heteropathic resource integration, but also to our perceptions of these as valuable events.

2.8.3. Conceptualisation of network interactivity

To define network interactivity, we adopt Rafaeli's (1988) description, who conceive it as the trail of interrelated messages in a communication medium (see Figure 6). According to Rafaeli's (1988) view, the incentive of users to interact resides in the benefits obtained in the communication with other users during online information exchanges.

Figure 6. Interactive communication



Source: Rafaeli (1988:120).

A prominent topic in the conceptualisation of interactivity has to do with the interconnected interactions that take place amongst several users during communication exchanges in computer-mediated communication (Abrams, 2008; Lowry, Romano, Jenkins, & Guthrie, 2009). Rafaeli's (1988) interpretation of interactivity relayed on the *glue* that holds together threads of messages and actors. Rafaeli & Sudweeks (1997) argued that communication is more collaborative than competitive, since interactivity affects socialisation in computer-mediated communication groups and messages contain humour and personal information and foster agreement.

Network interactivity is therefore regarded as an iterative mechanism that produces shared meaning (Rafaeli & Sudweeks, 1997): (1) messages respond to previous messages in a successive sequence, (2) and shared interpretative contexts are the process's primary main function. Rafaeli & Sudweeks (1997) argued that (network) interactivity is not a property of the medium, but a function of the communication process. The degree of interactivity depends on how much a trail of messages relate to each other and to the degree a given message responds to a previous message[39].

Based on Rafaeli's (1988) theoretical account on interactivity, Wu (2006:89) operationalised network interactivity with the following four dimensions: (1) responsiveness, also called reciprocity in earlier literature, and referred to how fast and frequent the responses are; (2) connectedness, or the connection of users who share their experiences and feelings; (3) playfulness or the joy of connecting with other users; and (4) perceived personalisation, initially labelled direction of communication in earlier literature (Nenonen & Storbacka, 2009). Altogether, they were considered a sufficient incentive for successfully interacting with other users (Zhao & Lu, 2012).

[39] Communication is affected by the interaction amongst customers, since interaction uses shared interpretive contexts and facilitates conversational interaction, which is an iterative process that generates meaning (Goffman, 1967, 1981; Bretz & Schmidbauer, 1983; McLaughlin, 1984; Rogers, 1986; Tannen, 1989; Schegloff, 1987, 1992; Walther, 1992). Thus, interactivity describes how verbal interaction is an iterative process that creates jointly generated meaning.

Customers often use digital technology and media to communicate and preserve existing social networks or establish new interpersonal relationships. Therefore, network interaction (social influence) must signal the feeling or effect of an individual's interaction with other individuals (Zhao & Lu, 2012). In network interactivity, the dimension of playfulness involves the enjoyment of the interaction with other users. Likewise, the dimension of connectedness provides a sense of connectivity when customers share his or her experiences and feelings through computer-mediated communication tools. Finally, the dimension of responsiveness reflects the speed and frequency of other users' responses that reply to previous messages. Although some studies consider playfulness a technical attribute, we claim that the enjoyment of digital tools encourages network interactivity (Tedjamulia, Dean, Olsen, & Albrecht, 2005).

The structure of the network is produced by the links that social and economic actors form to connect with other users of the network (Bidar *et al.*, 2016). These links are established on common skills, shared abilities, relationships and knowledge (Vargo & Lusch 2004, 2008). Bidar *et al*. (2016) defined the structure of a network as: (1) the connection between social and economic actors, through shared competences, relationships and information resources (Vargo & Lusch 2004, 2008); and (2) the expected value propositions that create the connections between social and economic actors (Lusch & Nambisan, 2015). As a result, the connection between users is based on the user's expectations that value will be delivered (Lusch & Nambisan, 2015). The quality and quantity of the connections form the network structure and result in the network's design and performance or functionality (Kane *et al.*, 2014)[40]. Institutional logics limits how users engage in service exchanges. Hence, individuals within the system are affected by the structure, containing rules and resources, leading to interaction and service provision between providers and customers (Edvardsson, Tronvoll, & Gruber, 2011).

The structure of the network is primarily based on interactions amongst network members (Kane *et al.*, 2014). Therefore, by *network interactivity*, we mean the interaction amongst the users that maintain the network's structure (Bidar *et al.,* 2016). Value co-creation is based on users that search for resources within the system (Lusch & Nambisan, 2015); hence, a larger number of connections imply a greater value for the system. As value is derived from user interaction during value generation, value propositions emerge (Saarijärvi, 2012), not from companies, but the space of interactions of users (Bidar *et al.*, 2016).

Network externalities[41] increase the perceived value of a service, not only in its economic value (Brynjolfsson & Kemerer, 1996) and also in the cognitive and affective beliefs associated with the goods or service (Lin & Bhattacherjee, 2008; Van Slyke, Ilie, Lou, & Stafford, 2007). Furthermore, given that external networks influence the perception of the utility and usefulness of digital technologies and media and the advantages obtained from social interaction, then network

[40] The network structure (Aarikka-Stenroos & Ritala, 2017) or the structure of networks (Wang, Lo, & Fang, 2005; Bhattacherjee, 2001) is another name for the market, since social and economic actors share: *'competences, relationships, and information resources'* (Bidar *et al.*, 2016:5) and whereby value propositions generate connections in the network: *'the type of connectivity (proximities, relations, interactions, flows) and ties characteristics (degree, affect, strength, symmetry) that forms the structure, affect network formation, with implications for platform's design and consequently influence the behaviour and dynamic of network'* (Bidar *et al.*, 2016:5). Institutional logics regulate how users engage in service exchanges. Individuals within the system are affected by the structure, containing tools, rules and resources for interaction and service provision between providers and customers (Edvardsson, Tronvoll, & Gruber, 2011).

[41] Direct network externalities (Kim, Park, Yun, & Kwon, 2017) influence individual interactivity by *'affecting perceived utility of the technology'* and the *'social benefits from social interaction'* (Zhao & Lu, 2012:827). Katz & Shapiro (1985) defined direct network externality as the utility and added obtained from the consumption of a good that increases when more users consume the same good. Indirect network externalities, such as perceived complementarity, refers to the added value when services are complementary. For example, users can post simultaneously on several hedonic SNSs, such as Instagram and Facebook.

externalities will affect the perception of users of the *machine* interaction and human interaction (Zhao & Lu, 2012). However, we do not study network externalities (therefore, we do not consider the network size, the number of followers of each user, or the user's social status in the network). Instead, we will examine the value co-created thanks to user's network interactivity.

Many digital technologies and media (Kwon, 2015; Morris, Hall, Davis, Davis, & Walton, 2003; Teo, Lim, & Lai, 1999), like a hedonic SNSs as Instagram, are used in search of self-filling value (Zhao & Lu, 2012), as pleasure and satisfaction. Precisely, the playful component of network interactivity provides the happiness and enjoyment that users obtain when they participate in online activities. These pleasurable experiences result in the perception of the best use of the SNS (Kang *et al.*, 2010).

The combination of network externalities, such as perceived network size (Katz & Shapiro, 1985), and the hedonic use of the technology or media results in stronger interactions amongst users. Notwithstanding, our model will focus on the perceived value derived from the hedonic use of SNSs and, more particularly, the influence of network interactivity on customer participation behaviour. This relationship had been pointed out in several studies (Bidar *et al.*, 2016; Zhang & Benyoucef, 2016; Shamim, Ghazali, & Albinsson, 2016; Zhao, 2019; Nambisan, & Baron, 2009), but it has never been examined in the context of hedonic SNSs.

2.8.4. Dimensions of network interactivity

As seen in the previous section, we propose that network interactivity has four dimensions: perceived personalisation, perceived playfulness, connectedness, and responsiveness. Based on the extant literature, we define each dimension as follows:

- Perceived personalisation entails the customisation of the virtual environment (Wu, 2006). It refers to how the digital media enable bidirectional communication between users (Beniger, 1987; Bretz, 1983; Chesebro, 1985; Duncan, 1989; Durlak, 1987; Garramone, Harris, & Anderson, 1986; Kirsh, 1997; Rafaeli & Sudweeks, 1997; Zack, 1993) and the necessary changes in the media during user experiences (Prahalad & Ramaswamy, 2004). Finally, it favours novel and subjective experiences that generate value co-creation (McMillan & Hwang, 2002).

- Perceived playfulness is a psychological episode of pleasurable nature that users who engage in exchanges with other users might experience (Sibai, 2016). Instagrammers go through playful experiences when they self-express, socially interact and use creativity, humour and enjoyment as a way to strengthen their bonding (van Vleet & Feeney, 2015) with a group of users that share a common narrative (Hsieh & Tseng, 2017; Lambert, 2013). In turn, playfulness leads to positive outcomes of cognitive absorption (Agarwal & Karahanna, 2000; Balakrishnan & Dwivedi, 2021), engagement (Rodríguez-Ardura & Meseguer-Artola, 2018), continued use (Pöyry, Parvinen, & Malmivaara, 2013) and purchase intention (Pöyry *et al*., 2013)

- Connectedness refers to the feeling of being together with the community of users, where users communicate their experiences, emotions and their shared feelings of togetherness. The impact of connectedness is due to the effect a network of actors might have on the self of each actor (Storbacka *et al*., 2016). Communicating and sharing similar interests increases the commitment, the participation of users and the possibility of having more

compelling immersive experiences online. Hedonic SNSs like Instagram are designed to maintain or strengthen existing relationships and to create new ones by reflecting upon the feelings of connection with other users (Zhao & Lu, 2012).

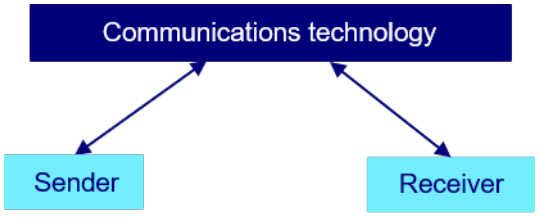
- Responsiveness refers to what extent a user perceives the speed and frequency at which other users respond to his or her publications. This dimension gravitates around the idea of a conversation: a message that responds to a previous message and generates a trail of messages (Zhao & Lu, 2012). Social exchange theory (Assiouras *et al.*, 2019) postulates that the benefit of participating in social exchange forms the basis for (online) interaction (Blau, 1964); users contribute whenever they expect to obtain a return (Wasko & Faraj, 2005), such as a return of time or cost and satisfaction. Also, users obtain benefits from social bonding and reciprocal exchanges of 'give and take', which motivate them towards online interactive behaviour (Blau, 1964). Users exchange information, hoping that other users will mirror their behaviour (Wasko & Faraj, 2005) to compensate for the time invested and associated costs. Increased responsiveness implies a better user's experience and more satisfaction with the interaction with other users.

  Responsiveness does not relate to the delivery speed or the speed at which users process messages, but to the level of reciprocity in the communication channel and the connection between the information requested and its response (Alba *et al.*, 1997; McMillan, 2002). For example, responsiveness means that users can navigate large repositories of content and get quick answers (Mahmood, Hall, & Swanberg, 2001; Jakob Nielsen, 2000; Wu, 1999). Conversely, a low response capacity (i.e., responsiveness) decreases perceived network interactivity by delaying and slowing down the flow of communication and redirecting users' attention towards other tasks.

2.8.5. Conceptualisation of perceived interactivity

Perceived interactivity of the medium of communication is a perceptual phenomenon[42] that occurs when users interact with online content and functionalities: *'the response (as perceived by the user) to the structural properties of the online medium or website'* (Liu & Shrum, 2002:55). To conceptualise it, we adopt Steuer's (1992:84) description of interactivity as: *'the extent to which users can participate in modifying the form and content of the mediated environment in real time'* (see Figure 8). We use this concept to capture the integration of operant resources through the perception of the actor's interactions with the artificial environment during customer value co-creation behaviour (Broekhuizen & Hoffmann, 2012).

Figure 7. Mediated communication



[42] Dennett's (1991) response to the problem of consciousness is that reality is configured with the interactive behavioural patterns of actors through intentional states. These patterns are perceived when the observer takes an *intensional* state during interactions with other actors. Although Davidson (2001) deemed these patters to be abstract, we argue that these are real and can be empirically studied and measured.

Source: Steuer (1992:8) and Krueger (1991:37), blue shades are own elaboration.

Steuer (1992) defined interactivity based on users' participation in modifying the mediated environment (in both form and content) during real-time participation. Steuer's (1992) construct of perceived interactivity is based on human-to-computer interaction theoretical accounts, in which communication technology is visible to the users. Furthermore, Steuer (1992) considered that the user's pattern of behaviour is dyadic; this is to say that users display both characteristics of media users and characteristics of computer users.

Several scholars followed in Steuer's footsteps (e.g., Mollen & Wilson, 2010; Van Noort, Voorveld, & Van Reijmersdal, 2012) even though they often re-named the dimensions of perceived interactivity that were initially suggested by Steuer, which were: two-way communication, active control, and synchronicity (Liu & Shrum, 2002; Yadav & Varadarajan, 2005).

Steuer's concept originated from a mechanical approach (Coyle & Thorson, 2001) where users interact with the digital environment, called *'interactive capabilities'* (Steuer, 1992:20). In fact, *'machine interactivity'* (Sicilia, Ruiz, & Munuera, 2005:32) makes it easier for customers to control the information presented in a specific time-sequence and duration (Ariely, 2000; Bezjian-Avery, Calder, & Iacobucci, 1998).

User control reflects the machine interactivity as long as it reflects the psychological evaluation of its technological features (Zhao & Lu, 2012). Control is related to the degree people perceive they have to master their interactions in the medium. In addition, Yadav & Varadarajan (2005) argued that control is vital during interactivity and even defines (machine) interactivity as the control perceived by the user (Zhao & Lu, 2012)

From the perceptual point of view, perceived interactivity can be described as the degree that users feel that their virtual experiences replicate their personal interactions (Zhao & Lu, 2012) considering the social presence of other users (Thorson & Rodgers, 2006). In synch with this, Zhao & Lu (2012) defined perceived interactivity as the extent to which a simulation of inter-personal interaction feels as if users are in the company of other people (Thorson & Rodgers, 2006). In our research, we recognise the impact of perception of the use of the medium as perceived interactivity, refuting the technologically oriented models (Breidbach & Maglio, 2016) of actual and expected interactivity (Broekhuizen & Hoffmann, 2012; Zhao & Lu, 2012).

2.8.6. Dimensions of perceived interactivity

Perceived interactivity has been usually characterised as a multidimensional experience (e.g., Mollen & Wilson, 2010; Van Noort, Voorveld, & Van Reijmersdal, 2012). The three most common dimensions of perceived interactivity considered in the literature are those initially suggested by Steuer (1992)[43]: (1) two-way communication, which incorporates the notion of mutual responses and exchanges; (2) control-ease of use, that is assumed to be the user's ability to influence the

[43] We consider perceived interactivity (Liu & Shrum, 2002) in line with the paradigm of human-computer interaction (Steuer 1992), which is linked to flow and feelings of telepresence (Burgoon *et al.*, 2000; Card, Newell, & Moran, 1983; Lowry, Romano, Jenkins, & Guthrie, 2009; McCarthy & Wright, 2017; Tripathi, 2011). Reeves & Nass (2000) argued that there are two lines of research in human-computer interaction, one that focuses on users' perception and the other that focuses on computer design. Articles with a users' perception focus on: (1) how users decipher the personality of the computer (Moon & Nass 1996); (2) the degree of agency that users perceive when they interact with computers (Huhtamo, 1999; Murray, 1997); (3) users' decision styles (Vasarhelyi, 1977); and (4) the objectives that users bring to the system (Belkin, Marchetti, & Cool, 1993; Xie, 2000).

medium of communication in learning and ease of use (Groth *et al.*, 2005); and (3) synchronicity, that refers to *'the degree to which users' input into a communication and the response they receive from the communication are simultaneous'* (Liu & Shrum, 2002:55).

We add to these dimensions two more constructs suggested by Leiner & Quiring (2008) and related to control: (1) active control, a *'voluntary and instrumental action that directly influences the controller's experience'* (Leiner & Quiring, 2008:7); and (2) perceived behavioural control of the medium (Leiner & Quiring, 2008). This is due to the fact that, during resource integration, users need operant resources to act on operand resources (and other operant recourses) (Mollen & Wilson, 2010; Voorveld & Reijmersdal, 2012; Voorveld *et al.*, 2011) that modify the perception of the medium of communication following the theory of planned behaviour (Lim & Weissmann, 2021; Rubio, Villaseñor, & Yagüe, 2019).

Based on the extant literature, we conceptually define these five dimensions of perceived interactivity (i.e., two-way communication, control-ease of use, active control, perceived behavioural control, and synchronicity) as follows:

- The two-way communication dimension *'captures the bi-directional flow of information'* (Liu, 2003:2). This exchange of information in both directions represents the give-and-take of ideas between customers within the reference group. The flow of information follows a precise temporal sequence in which a message closely related to the preceding message (Alba *et al.*, 1997; Rafaeli & Sudweeks, 1997; Liu, 2003). Bidirectional communication exists throughout the communication channel that mediates in the flow of information (Downes & McMillan, 2000). Two-way communication focuses on the mutual connection with the customer, who can be both a source and a recipient.

  Two-way communication is defined as mutual discourse and the ability to interact with other individual users (Ball-Rokeach & Reardon, 1988; Hanssen, Jankowski, & Etienne, 1996; Liu & Shrum, 2002; Williams *et al.*, 1988) or the user's capability to give feedback (Day, 1998; Ha & James, 1998; Newhagen, Cordes, & Levy, 1995). There is a dichotomy between mutual discourse and feedback (Ball-Rokeach & Reardon, 1988; Burgoon *et al.*, 1999; Hanssen, Jankowski, & Etienne, 1996; Williams, Rice, & Rogers, 1988) and feedback (Day, 1998b; Duncan & Moriarty, 1998; Ha & James, 1998; Newhagen, Cordes, & Levy, 1995). An in depth examination of the role of two-way communication shows the social aspect (friendliness) of the conversation. Although there is a strong link between bidirectional communication and feedback, we emphasise in this thesis the social aspect (friendliness) of the conversation in two-way communication, since it generates personal intention and a positive e-WOM.

- Control-ease of use is connected to 'machine' interactivity, and the perception users have of the attributes of the digital technology. It is a core component of perceived interactivity (Bezjian-Avery, Calder, & Iacobucci, 1998; Jensen, 1998; Rogers, 1995; Steuer, 1992) that captures the user's influence on the medium of communication, and in the information sent and received (Jensen, 1999; Rogers, 1995), through the personalisation of messages (according to the communication objectives of the users) and the modification of the conditions that increase co-creation.

  Control-ease of use reflects the perception of ease of use, defined as users' belief that they will not have problems using a system (Zhao & Lu, 2012). In hedonic SNSs like Instagram, users can learn and adapt to the frequent updates and integration with other

services, thus reducing the cost of service exchanges (Zhao & Lu, 2012). We affirm in this thesis that control-ease of use over a technology is manifested in the belief *'in one's capabilities to organise and execute the courses of action required to produce given attainments'* (Bandura, 1997:3) which is a component of the theory of planned behaviour.

- Active control implies that the individual user can voluntarily modify in real time (unplanned) the medium of communication to communicate, and it refers to *'user's ability to voluntarily participate in **(real time and unplanned)** and instrumentally influence a communication'* in real time (Liu, 2003:2). In addition, users who possess active control can communicate reciprocally and synchronously (Mutum & Ghazali, 2011). Active control reflects intentionality in the use of the medium of communication and how users communicate and interact with the medium of communication.

- Perceived behavioural control is the users' empowerment when they employ digital media, which is users' feelings of being in command of the information flow and customising the mutual exchanges that please and gratify them (Liu, 2003). Perceived behavioural control is a fundamental concept in the theory of planned behaviour (Ajzen, 2020), and it positively affects the user's behavioural intention (Hoffman & Novak, 1996). Perceived behavioural control has two correlated sub-dimensions, that is, self-efficacy and controllability. Self-efficacy quantifies the belief in his or her abilities to succeed in performing a behaviour. Controllability measures how performing a behaviour is due to external feedback (Ajzen, 2002).

  While each sub-dimensions reflects internal and external control, perceived self-efficacy predicts more the behavioural intention of actors than controllability (Ajzen, 2002). Therefore, self-efficacy measures perceived behavioural control (internal disposition) (Zadeh, Zolfagharian, & Hofacker, 2019).

- Synchronicity relates to the perception of the speed of the interaction (Liu, 2003); it *'characterizes whether interaction occurs concurrently or sequentially'* as perceived by the user (Al-Deen & Hendricks, 2011:164). The human-computer interaction paradigm establishes that users can interact synchronously, such as in text messages or online chat, or asynchronously, such as in conventional online discussion forums (Bucy & Tao, 2007). The connection between time and communication refers to whether the communication occurs or not in real time as perceived by the user.

  In fact, perceived interactivity is affected by the time messages take to travel from user to user and the time users take to process messages during service delivery. For interactive systems to work: *'the ideal is to have the computer moving at a speed that doesn't inhibit the user'* (Crawford, 1990:105). The perceived advantage of interactive systems is that customers can utilise at their own time and pace, choose their own navigation routes and develop their individual models and mental schemes (Latchem, Williamson, & Henderson-Lancett, 1993).

  Some authors (Kiousis, 1999; Murray, 1997; Steuer, 1992; Straubhaar & LaRose, 1996)[44] argued that the perception of real-time (or synchronous communication) is key to the

[44] Synchronicity varies in 'duration, regularity, frequency and concurrency'; all characteristics are related to the impact of recency of an individual actor on other actors (Storbacka *et al*., 2016:3013), such as: (1) duration, that can be short or long; (2) regularity, this is recency as in the length of time between two consecutive interactions; (3) frequency, this is recency as in the number of repeated interactions in a given period of time; and (4) concurrency, this is simultaneity to the extent that

notion of interactivity. On the contrary, other authors (Rheingold, 1993; Williams *et al.*, 1988) proposed that the perception of asynchronous communication is key in the benefit obtained by users. Some studies that compared the perception of synchronous and asynchronous interactions (Downes & McMillan, 2000; Hesse, Werner, & Altman, 1988; McGrath, 1990; Morris & Ogan, 2006; Walther, 1992) agreed with the first group. This implies that if the the perception of the speed at which the interface processes communication is low, it can inhibit interactions amongst users (Crawford, 1990).

2.9. Coleman's bathtub as a micro-foundation for value co-creation in SNSs

The microfoundational movement provides a multi-level explanation to value co-cocreation and represents it by what is now known as the Coleman bathtub or the Coleman 'boat' (Barney & Felin, 2013). In essence, the microfoundational approach consists of choosing a lower level of analysis. Coleman (1990), and some other scholars after him (Hedström & Ylikoski, 2010; Raub, Buskens, & Van Assen, 2011; Storbacka & Nenonen, 2016), distinguished *'between the macro-macro level explanation (where social facts lead to social outcomes) and the micro-micro level explanation, where conditions for action lead to observable'* interactions (Storbacka & Nenonen, 2016:2). The 'bathtub' is created by the links between the macro-micro explanation (where the social facts inform conditions for action), and the micro-macro explanation (where observable interactions inform social outcomes).

Although it is commonly accepted that value is co-created amongst actors that interact in a network, the locus of value co-creation is not clearly identified, and its boundaries are blurred (Nenonen & Storbacka, 2010). Furthermore, various lines of research under service-dominant logic agreed that the locus of value co-creation is not placed within the company's limits, but it is situated amongst actors in the 'network market' (Nenonen & Storbacka, 2010:9). Under the service-dominant logic, value is created when actors interact with other actors that exchange their personal operant resources (Vargo & Lusch, 2004, 2008b), but is often confused with earlier concepts such as co-production or co-innovation (Alexander, 2012). Value is created by actors that exchange operant resources embedded in a service ecosystem and integrate them (Payne *et al.*, 2008).

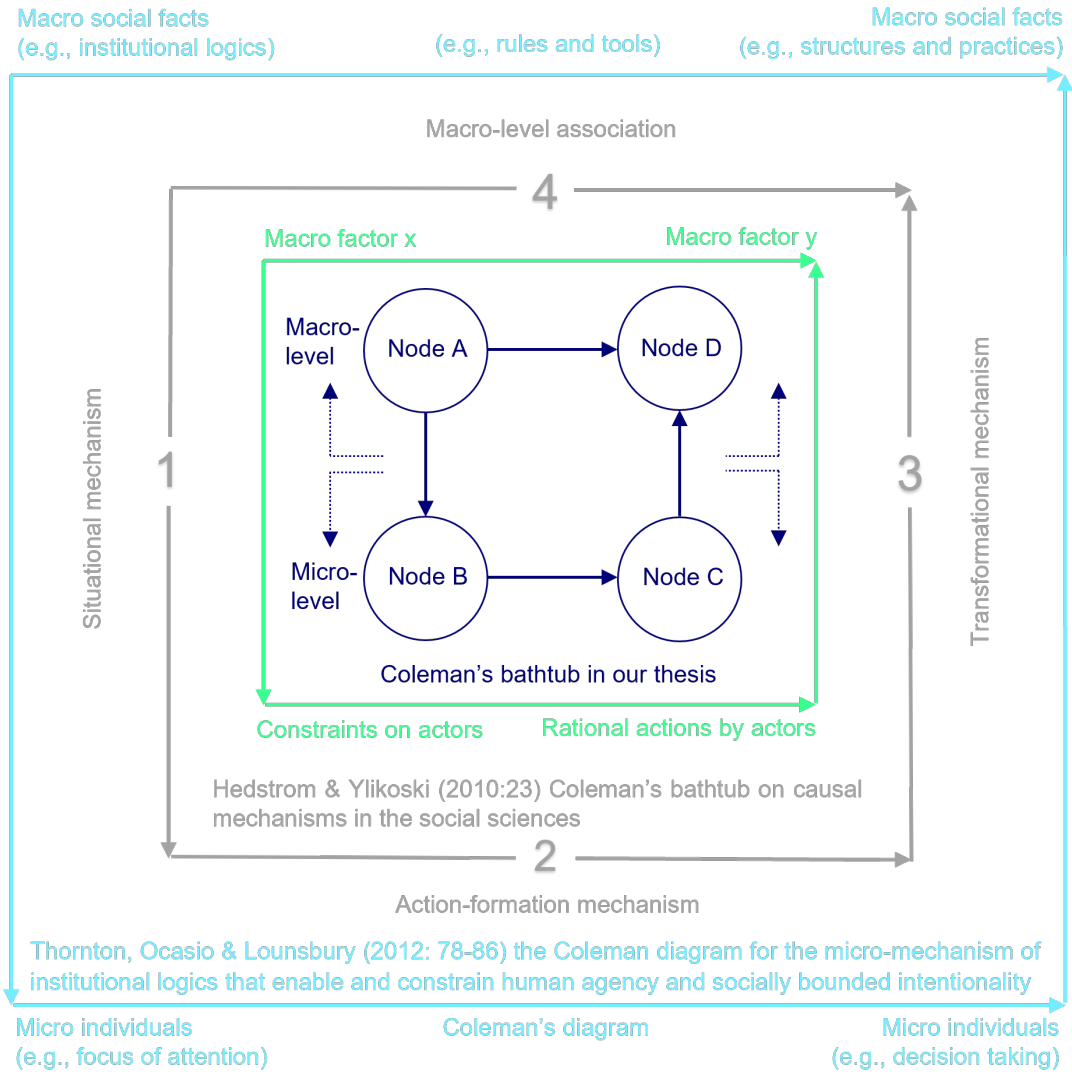
In this thesis, we assume that the locus of customer value co-creation is placed in the mutual exchange of operant resources (skills, knowledge and relationships), that are embedded in the service ecosystem. Thus, the exchange through the interplay between extra-roles and intra-roles amongst the various actors interacting with the network aims to control the flow of information and services in the engagement platform.

Elaborating on the notion of the Coleman bathtub, Hedström & Swedberg (1998) introduced the typology of social mechanisms. They postulated that there are three different types of social

many actors interact synchronously or asynchronously with other actors. Perceived interactivity is affected by the time messages take to travel from user to user and the time users take to process messages during service delivery. For interactive systems to work: 'the ideal is to have the computer moving at a speed that doesn't inhibit the user' (Crawford, 1990:105). The speed of response is a problem for developers and users of interactive platforms (Dellaert & Kahn, 1999; Kay, 1990; Nielsen, 2000; Vora, 1998). The benefit of interactive systems is that users can operate at their own time and pace, choose their own navigation routes and develop their individual models and mental schemes (Latchem, Williamson, & Henderson-Lancett, 1993). Unfortunately, the speed of response is a problem for developers and users of interactive platforms (Dellaert & Kahn, 1999; Kay, 1990; Nielsen, 2000; Vora, 1998).

mechanisms at work: (1) the macro-micro mechanisms, also labelled as *situational mechanisms*, that help to understand how macro-level-generated conditions or contexts affect actors; (2) the micro-micro mechanisms, known as *action-formation mechanisms*, which explain how individual actors assimilate the contextual circumstances into action; and (3) the micro-macro mechanisms labelled *transformational mechanisms*, that describe how various actors produce macro-level outcomes due to their mutual actions and interactions (see Figure 8).

Figure 8. Coleman's bathtub for social interaction



Source: adapted from Hedström & Ylikoski (2010:23).

Our theoretical model is based on the microfoundational approach (Foss, 2016) that considers social phenomena, such as value co-creation during usage of the hedonic SNS of Instagram, as high-level collective events that determine low-level causality – which in turn create an upward effect at a higher level. This approach is based on Coleman's rationale (1990) that macro-level relationships are mainly based on micro-level phenomena.

According to the micro-foundation movement (Molina-Azorín, 2014; Foss, 2016), interactivity amongst actors is a micro-foundation for value co-creation (Foss & Lindenberg, 2013) in the context of a service ecosystem. The bathtub focuses on our research problem of the interactivity of the individual actor, both in a network and perceived, as a micro-foundation for the joint creation of value in hedonic SNSs, like Instagram. We show in Figure 8 how Thornton, Ocasio, & Lounsbury (2012), and Hedström & Ylikoski (2010) used Coleman's (1990) bathtub.

Our starting point is that customer value co-creation behaviour is not observable at the macro-level, whereas an actor's interaction with other actors is observable (i.e. observed variables) at the micro-level. Therefore, customer value co-creation behaviour is more likely to be measured in hedonic SNSs, like Instagram, in which customer's resources are embedded in the broader service ecosystem. In our research, we examine through the integration of operant resources that are embedded in service ecosystems (Edvardsson *et al.*, 2012; Edvardsson *et al.*, 2014) and use social mechanisms that shape the behaviour of actors (Coleman, 1990).

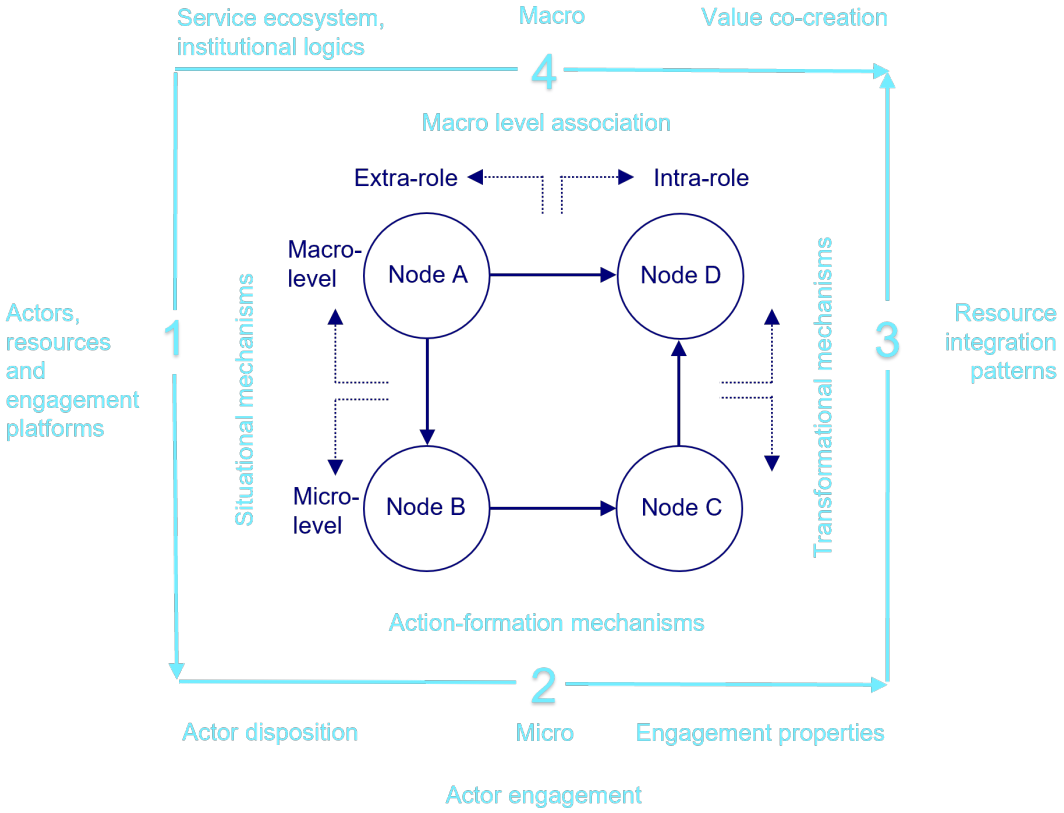
Actors might be human beings or machines, and their various interactions. Under the service-dominant logic, the interactivity of actors is defined as the disposition and willingness to interact in the process of integration of operant resources within a service ecosystem (Storbacka *et al.*, 2016).

The service-dominant logic theory helps us address the concept of customer value co-creation behaviour when Instagram users express increased advocacy levels during unplanned and voluntary customer-to-customer interactions (Porter & Kramer, 2011; Reichheld, 1996; Spaulding, 2010). One of the basic premises of the service-dominant logic is value co-creation, in which the customer is *'a co-creator of value'* through resource integration; the firm simply presents value propositions in which *'service is the fundamental basis of exchange'* (Vargo & Lusch, 2008c:7).

Payne *et al.* (2008) developed a research framework of value co-creation based on resource integration under the service-dominant logic, although their analysis did not consider the type of resources that each actor possesses and the interface actors use to interact with other users. While operant resources reflect personal and individual capabilities and social abilities (Baron & Harris, 2008), little research studies the exchange of personalised and individual resources during customer value co-creation behaviour, e.g. customer resource integration processes (Alves, Fernandes, & Raposo, 2016).

Storbacka & Nenonen (2016) theoretically applied the micro-foundation of actors' engagement to explain value co-creation. These authors assessed the critical factors that link the extra- and intra-roles of engagement with the predominant theory of social interaction (Coleman, 1990) to study the creation of new markets. Although Storbacka, & Nenonen's (2016) paper lacks empirical evidence, it helped develop the microfoundation movement for value-creation. Therefore, we propose to include interactivity and empirically validate the conceptual model in hedonic SNSs in our study (see Figure 9).

Figure 9. Coleman's bathtub for social interaction applied to actors' engagement



Source: adapted from Storbacka & Nenonen (2016:3010).

We focus on actors' interactivity as a micro-foundation of value co-creation in this thesis. Scholars have argued that value co-creation is rooted in the actions and interactions of individuals in the context to which they are exposed (Alexander, Evanschitzky, & Murray, 2012; Leclercq, Hammedi, & Poncin, 2016; Majboub, 2014; Payne *et al.*, 2008; Ranjan & Read, 2014; Vargo & Lusch, 2011)

Our research framework focuses explicitly on actors' interactivity as a micro-foundation for value co-creation in hedonic SNSs, like Instagram. For customer value co-creation to occur, actors must interact – in a service-for-service exchange – during the integration of the actors' operant resources, leading to the creation of value-in-use and value-in-context.

We use Coleman's (1990) bathtub for the micro-foundation of customer value co-creation behaviour mediated by the interactivity of actors at the micro-level. See Harmon *et al.* (2019) for an extensive review of the multiple micro-theories (Camerer, 2003; Lindenberg, 2001; Loewenstein, 2007) – or micro-foundations of institutions – used in micro-macro models. Coleman's (1980) main aim, in the 1980s, was to combine social and economic theory by introducing rational choice theory in his well-known bathtub model (Favereau, 2005).

2.9.1. Micro-macro models of cooperation in rational choice theory

We focus on micro-macro models of cooperation and the critical components of the micro-foundational research in social dilemmas (Raub & Buskens, 2013), such as the rational choice theory and the prisoner's dilemma (Camerer, 2011). The prisoner's dilemma allows the tractability of the rational choice model during C2C interactions in like-for-like situations.

An interactive property is an observable C2C interaction in which we recognise four categories related to rational choice theory: the contextual aspects of co-production versus value-in-use interactivities (perceived personalisation), actors' disposition versus interactivity properties (playfulness), relational properties (connectedness) and informational properties (responsiveness).

Therefore, rational choice theory is based on these four dimensions (perceived personalisation, playfulness, connectedness and responsiveness), that portray observable interactivity categories.

- Perceived personalisation represents the contextual aspects of co-production versus value-in-use interactivities. Frow *et al.* (2015) developed this categorisation, initiated by Ranjan & Read (2014), and proposed that value co-creation interactivities can be splitted into: (1) co-production activities of goods, such as co-design, co-development, co-production, co-promotion; and (2) value-in-use activities, in which actors participate using the resources of other actors that are not actively present.

- Playfulness is the dispositional property during a user's interaction with other users. This includes how the temporal and relational disposition of an actor – and its characteristics – are related to the motivations for interaction (monetary, hedonic, access to resources), levels and degree of the disposition (quality) to interact, the type of interaction (cognitive, emotional or behavioural) and the valence of an actor's initiatives (Frow *et al.*, 2015).

- Connectedness is a relational property, which means that an actor's interactivity is affected by his or her existing relationships. Frow *et al.* (2015) stated that interactivity is defined by the actor's current social and institutional roles and his or her connections in a service ecosystem. The relational properties of an actor in a service ecosystem involve: (1) several types of relationships; (2) the extent to which his or her market position is central in the service ecosystem; and (3) if the position is of relative power.

- Responsiveness is an informational property. Interactivity fluctuates with respect to how actors handle information. It is important to consider whether an actor trying to influence other actors either seeks to mobilize support or has access to resources (Frow *et al.*, 2015).

2.9.2. The prisoner's dilemma in rational choice theory

Consistently with rational choice theory, the prisoner's dilemma is represented as arrow 2 of Coleman's bathtub (see Figure 8). In the well-known micro-model of the prisoner's dilemma and the micro-assumptions (shown in Table 4), the pay-outs of T, R, P, and S are quantifiable outcomes of two actors at the end of an experiment as his or her own points, or as in our case, these are 'likes' in the user's profile. In the traditional version of the prisoner's dilemma, actors'

interest is related to the selfish capitalisation of their own utilities (Raub *et al.*, 2011). Actors develop insights into the game by gathering information from opposing actors.

Therefore, the pay-offs shown in Table 4 are practical outcomes that embody the *'normative'* configurations of the competition. In the prisoner's dilemma: *'defection is a dominant strategy for each of the actors and equilibrium behaviour thus implies mutual defection as the micro-outcome. Also, Table (5) reveals that defection by both actors implies Pareto suboptimality as a macro-outcome'* (Raub *et al.*, 2011:16). This explains why 'likes' is a scarce resource in hedonic SNSs and how they are perceived as limited commodities in a user's profile.

Table 4. The prisoner's dilemma (T>R>P>S)

		Actor 2	
		Cooperation	Defection
Actor 1	Cooperation	*R, R*	*S, T*
	Defection	*S, T*	*P, P*

Source: Raub *et al.* (2011:14).

Intended for Coleman's bathtub, an important macro-condition in the classical version of the prisoner's dilemma is that actors cannot perform: *'binding agreements and commitments…and…it is a one-shot rather than a repeated game'* (Raub *et al.*, 2011:16). This macro-condition occurs in our model at the macro-level of customer citizenship behaviour. This means that users can solely exchange operant resources during resource integration at the macro-level of customer participation behaviour.

In line with rational choice theory (Favereau, 2005), the incentive- and goal-driven behaviour during C2C interactions, such as the prisoner's dilemma, is embedded in social dilemmas of cooperation (Rasmusen, 2007).). It corresponds to the notion of *'equilibrium behaviour'*, in which *'each actor maximizes own utility, given the other actor's strategy'* (Raub *et al.*, 2011:16). However, rational choice theory and the prisoner's dilemma requires additional assumptions and consequences, beyond the *'utility maximization'* and the *'equilibrium behaviour'*.

- Assumptions, such as cooperation and defection, are options, alternatives, tastes and complete information of actors that are embedded in node B of the Coleman bathtub (Raub *et al.*, 2011) (see Figure 9).

- Consequences, such as perceived behavioural control, are represented in node C of the Coleman bathtub. Ajzen (1991, 2002) stated that perceived behavioural control of technology is a key construct in the prisoner's dilemma. Battacherjee (2001) argued that perceived ease of use is reflected in control-ease of use.

We will use rational choice theory and the prisoner's dilemma to analyse action-formation mechanisms in 'like-for-like' situations during resource integration of operant resources in our conceptual model (see Figure 9).

2.9.3. The problem of parsimony in rational choice theory

Traditional rational choice theory is parsimonious[45] at the micro-level of analysis, thus improving the simplicity of the model (Ogu, 2013). Parsimony helps us track micro-macro links in models that involve social dilemmas, when more complexity is added to rational choice theory (Coleman, 1986, 1990; Wippler & Lindenberg, 1987), such as social capital theory (Favereau, 2005). Simplicity is due to higher order constructs that help us reduce the number of path model relationships, resulting in a more parsimonious model (Edwards, 2001; Johnson, Rosen, & Chang, 2011; Polites, Roberts, & Thatcher, 2012).

Social capital is an additional element in the rational choice theory: *'Coleman's project was to resocialise rational choice while keeping micro-macro connections as operational as they are in economics'* (Favereau, 2005:103). Social capital has structural (quantity of network), relational (quality of network), and cultural (common values of networks) embeddedness (Laud *et al.*, 2015) that facilitate the generation of value-in-context (Moran, 2005). Social capital is a conceptual tool that introduces the social structure into rational choice theory:

- Laud & Karpen (2017) argued that social capital theory provides information about the relationship between individual performance and social interaction (Bourdieu, Granovetter, & Swedberg, 2001; Coleman, 1988; Moran, 2005; Putnam, 2000) and provides a means to link embeddedness to resource integration.

- Lin (2001) stated that resources: (1) are embedded into social structures; (2) can be activated through relationships amongst individuals; and (3) people integrate resources deliberately to maximise utility. This is in line with service-dominant logic, as actors unlock the value of resources (Laud & Karpen, 2017) embedded in service ecosystems.

Coleman (1990) extended the traditional rational choice model with social capital theory to consider social norms and organisations. Coleman (1990) stated that a norm exists about an event when the individual is socially controlled, not by the actor, but by other individuals (active control). There is a consensus in society that permission to control is own not by the actor him or herself, but by other actors of the network when a norm exists.

Following the rational choice theory (Coleman, 1990), the parsimony of our model entails that the integration of operant resources that are embedded in service ecosystems seeks to maximise the generation of social capital during C2C interactions with a minimum of parameters. We aim to achieve in our model a maximum of predictive power (dimensions) with a minimum of parameters (path model relationships) in macro- and micro-levels and in extra- and intra-roles. Opposite to Wajid, Raziq, Malik, Malik, & Khurshid (2019), we do not postulate a meso-level analysis in the resource integration process.

[45] Parsimony in rational choice theory is defined as: *'the common knowledge of rationality assumption, the assumption of isomorphic and self-regarding utility function, when combined with the rational optimisation model, allow rational choice theories to treat variations in choices amongst actors and by an actor over time as entirely a function of their structural position. Preferences* (control-ease of use) *and beliefs* (perceived behavioural control) *are simply perceived as the only relevant variables for determining action'* (Ogu, 2013:94). Also, parsimony has been linked to: (a) falsifiability (Popper, 1945), due to the fact that models are never fully empirically confirmed, but new research fails to disconfirm the model (Anderson & Gerbing, 1998); and (b) causality (Baumgartner, 2015), since although a model has acceptable fit parameters, new models might emerge that have better fit parameters and fewer pathways connecting the constructs (Anderson & Gerbing, 1998).

The parsimony[46] of the traditional rational choice theory at the micro-level allows us to infer more sophisticated micro-macro model effects when embeddedness generates cooperation (instead of defection/desertion) in the prisoner's dilemma. For example, parsimony helps to explain that cooperation results from selfish actors who follow the rational principles of reciprocity *'in the sense of tit for tat-like behaviour'* (Raub ***et al.***, 2011:16). This indicates that Becker's (1976) famous rule can be helpful for simple assumptions about stakeholder preferences and to analyse macro effects when rational choice theory is used (instead of making more complex assumptions).

The problem posed by parsimony, or the oversimplification of traditional rationality, has been underestimated in the literature (Becker, 1976; Goldtborpe, 1996; Harsanyi, 1976, 1977) on the basis that inaccuracies will be resolved in time with more empirical work[47]. For example, Harsanyi (1976, 1977) argued that rational choice theory could help to establish a benchmark, so empirical data become explanandum for more refined micro-macro model antecedents and consequences. Goldtborpe (1996) claimed that errors that predict individual behaviour are cancelled out at the macro level.

However, Coleman (1986; 1990) pointed out that replacing rational choice theory with more complex micro-level theories undermines the traceability of the micro-macro model, which means that it will be impossible to derive macro-level outcomes and consequences with *'more complex bridge assumptions and transformation rules'* (Raub ***et al.***, 2011:16). Therefore, we maintain traditional rational choice theory at the micro-level and use the theory of planned behaviour to derive macro-level outcomes (Ajzen, 2020) in resource integration.

2.9.4. Theory of planned behaviour in resource integration

In parallel with Coleman's rational choice theory, we follow Ajzen's (1991) theory of planned behaviour to examine the transformational mechanisms represented in arrow 3 in Figure 9, during resource integration of operant resources. We apply the theory of planned behaviour to study the link between users' beliefs and users' behaviour: if users conceive a suggested behaviour as positive, and if peer users want them to perform the behaviour (group norm), this results in a greater willingness, that in turn results in a greater intention that leads to the behaviour[48]. Similarly to rational choice theory, the theory of planned behaviour seeks utility maximisation (Opp, 2019) during co-creation practices.

Ajzen & Sheikh's (2013) argued that the intentionality of a specific behaviour is predicted from actor's attitudes, subjective norm and perceived behavioural control, which in turn affects user control-ease of use and finally active control. This means that the saliency or significance of the

[46] Another example of the need for parsimony is when we replace the *'macro-condition 'one-shot interaction"* (Raub ***et al.***, 2011:16) with more complex macro-assumptions such as embeddedness (Granovetter, 1985), the prisoner's dilemma with iterative interactions between two actors, or when the two actors in the prisoner's dilemma are part of a network, where third parties, that receive information about the behaviour of their opponents are involved.

[47] In traditional rational choice theory, parsimony lacks sufficient empirical demonstration when actors are dependent on each other. They argued that empirical regularities in contexts with and without strategic interdependencies amongst actors are equally difficult to harmonised with rational and selfish behaviours (Raub ***et al***., 2011).

[48] Intentionality is intensional. In other words, intentionality follows intensional logic. The attribution of intentional states to a human being is intensional in the sense that the objects of thoughts have intensional properties, i.e., mental acts that form intensional contexts such as the explanation for a behaviour. Value and meaning in two-way communication can be described through intensional logic through algorithms (Fitting, 2020).

norms (normative) and beliefs about the perceived behavioural control (internal disposition) affects control-ease of use (willingness)[49] and, in turn, affects actual control (intentionality).

In sync with this, the resource integration of operant resources process requires the intentionality of actors. Machine and human actors support the notion of internal disposition[50] (Davenport, 2013), while maintaining the shared institutional logic of the context that governs the willingness of actors to interact. For a single actor to be able to see the interactivity of other actors, an individual actor requires: (1) to have a longitudinal view of other actors with respect to the viewer and be able to comprehend the temporary chain of events *'and so to understand both past, present and desired futures of the actor'* (Storbacka *et al.*, 2016:3012); (2) to collect and process information about actors' interactivity, including their evolution in time; and (3) to understand the shared institutional logic, that informs and motivates all actors involved.

Therefore, there are four dimensions related to the theory of planned behaviour that support the intentionality of actors (active control) during resource integration of operant resources in hedonic SNSs: (1) interaction practices due to shared institutional logic or interactivity properties (two-way communication), (2) the willingness of actors (control-ease of use), (3) the internal disposition of machine and human actors (perceived behavioural control); and (4) time-based practices or temporal properties (synchronicity) (Lim & Weissmann, 2021; Rubio *et al.*, 2019).

- Two-way communication is the interaction practice or interactivity property. To fully understand the interactivity of actors, we focus on shared institutional logic and observe values, norms and principles that influence the interaction amongst actors whose resources are embedded in a service ecosystem. Shared institutional logic leads to time-based interactivity practices that become routine over time (Storbacka *et al.*, 2016). Customers can engage at different levels and be motivated by internal or external, elements when users interact repetitively in self-service transactions with an organisation. Regarding two-way communication in resource integration, control-ease of use of online content facilitates personal intention and produces positive WOM for firms (Novak, Hoffman, & Yung, 2000).

- Control-ease of use is the willingness of actors (Polese, Pels, Tronvoll, Bruni, & Carrubbo, 2017), i.e. their active desire to achieve a result in a specific or designed context (Kumar, Purani, & Viswanathan, 2018:139), where *'composite factors such as complexity, coherence and legibility (...) are perceived in combination'*. Given the option in which actors interact with autonomous machines that also possess the programmed disposition to achieve a result, we need to consider that machines will have programmed (conditioned) willingness to integrate resources in the near future. Therefore, future human-to-technology interactivity might consider the programmed (conditioned)

[49] The notion of a co-creation practice in which the actor's willingness (control-ease of use) is an essential intra-role condition for the materialisation of macro-social outcomes, (e.g., structures and practices) is common in all definitions of actor's engagement (Brodie, Hollebeek, & Jurić, 2011; Chandler & Lusch, 2015)..

[50] We build on the concept of actor's internal disposition of machine and human actors (Chandler & Lusch, 2015), which is the ability of an actor to act here and now as a reaction to past events, or is aimed at a specific outcome in the future. Internal disposition is a human psychological condition that differs from the idea of the actor as human/machine (Brodie, Hollebeek, & Jurić, 2011; Chandler & Lusch, 2015). The main distinction is intentionality which is an integral part of human agency. Since human agency posses intentionality, but material agency has not, we posit that intentionality is solely a human condition (Leonardi, 2012; Pickering, 2001) in resource integration. Therefore, machine actors are not equivalent to human actors, since digital technology has no agency or intentions beyond its programmed responses; that is, digital technologies are not independent actors from human actors. However, new digital technologies are increasingly capable of autonomous behaviour and, therefore, more capable of engaging human actors and other machine actors in interactivity (Hu, Lu, Pan, Gong, & Yang, 2021).

willingness of machine actors (Storbacka *et al*., 2016). It is only *'when comparing people and the current best algorithms in AI and machine learning, people learn from less data and generalize in richer and more flexible ways'* (Lake, Ullman, Tenenbaum, & Gershman, 2016:38).

- Perceived behavioural control is the internal disposition of the human or machine actors, i.e., an internal belief that resides within the individual actor. With reference to perceived behavioural control in resource integration, it is the level of external influence on the creation of an internal belief that users perceive during human-computer interaction (Huhtamo, 2000). A high level of perceived interactivity is based on the internal feeling of *'being in control'*, and it is similar to customers who feel they can purchase online with freedom of choice and without any obligation. It should already be clear that the future willingness to engage or interact (Assiouras *et al*., 2019) extends beyond the psychological conditions of human actors to include gradually more independent technologies with *'conditioned agency'* (Storbacka *et al.*, 2016:3013), which is similar to human agency, that converts past experiences into future actions (Harmon *et al.*, 2019).

- Synchronicity is the temporal property, which is related to the perception of the speed of the interactivity features and functionalities. An element that is critical in the research of perceived synchronicity is the necessary skills and knowledge that users possess to navigate speedily through a large amount of information and succeed in their information search (Mahood, Kalyanaraman, & Sundar, 2000; Nielsen, 2000; Wu, 1999).

Chapter 3. Conceptual model and research hypotheses

In this chapter, we build a conceptual model with external and internal user's roles and macro and micro levels of analysis (Giddens, 1984). This model considers the potential mediating effect of interactivity on customer value co-creation behaviour with increased advocacy levels during voluntary and unplanned usage of Instagram.

We present and justify a set of hypotheses that refer to the causal and mediating links between the various extra- and intra-roles and macro- and micro-levels of analysis following the social mechanisms in the Coleman bathtub (1990). These hypotheses refer to: (1) a potential effect of customer citizenship behaviour on network interactivity (section 3.3); (2) a prospective impact of network interactivity on perceived interactivity (section 3.4); (3) a hypothetical triggering influence of perceived interactivity on customer participation behaviour (section 3.5) and (4) a presumed causal path from customer citizenship behaviour to customer participation behaviour (section 3.6).

We study the social mechanisms involved in the co-creation of value amongst users of the hedonic SNSs of Instagram through a micro-foundation of value co-creation lens based on: the cognitive consistency theory (Monge & Contractor, 2003), the rational choice theory and social capital theory (Coleman, 1990), the theory of relational governance (Heide, 1994), and the theory of planned behaviour (Ajzen, 2020). As we follow the chain length effects of the sequential social mechanisms, we propose, in arrows 1, 2 and 3 (section 3.2), a new taxonomy (Park, Shin, & Ju, 2015) of the process of resource integration of operant resources at the micro-level of C2C interactions in hedonic SNSs like Instagram.

3.1. Conceptual model

Interaction is understood as the fundamental precondition of any relationship (Forsström & Törnroos, 2005). The significance of C2C interactions is stressed in the literature of the service-dominant logic (Lusch & Vargo, 2006; Vargo & Lusch, 2008c). Vargo & Lusch (2004; 2006; 2008) reiterated the importance of the combined effects of networks and perceptions on users' interactivity during value co-creation activities under the service-dominant logic. Although some researchers (Mpinganjira, 2016; Lopes & Serrasqueiro, 2017) agreed that interactivity plays an essential role in customer value co-creation behaviour, none empirically studied the link between customer value co-creation behaviour and interactivity under the under service-dominant logic.

Due to the ability of low-level phenomena (e.g. interactivity) to explain high-level phenomena (e.g. customer value co-creation behaviour) (Felin & Hesterly, 2007), we develop a conceptual model to explore and explain customer value co-creation practices as a result of interactions amongst users during unplanned and voluntary usage of the hedonic SNS of Instagram[51]. Our conceptual model has an implied categorised structure based on activities (social mechanisms) that guarantees the systematic analysis of the concept of customer value co-creation behaviour resulting from interactivity.

We propose a conceptual model of the mediating role of interactivity on customer value co-creation behaviour (Chen & Vargo, 2010) in hedonic SNSs based on service-dominant logic. We examine how value is co-created when actors exchange their personal operant resources (Vargo

[51] A search in Research Gate in April 2020 produced only 20 articles on the combined topics of value co-creation, interactivity and hedonic SNSs. To the best of our knowledge, this is the first research to address the multilevel, i.e.macro-micro-macro, (causal) logic of the Coleman bathtub for a large sample size of users of a hedonic SNSs.

& Lusch, 2004, 2008b) and integrate these operant resources during their interactions with other actors (Lusch, Vargo, & Gustafsson, 2016) in a hedonic SNSs like Instagram.

Thus, we quantitatively study what behavioural response patterns (Mahoney, 1999; Prahalad & Ramaswamy, 2004b) in users with increased advocacy levels during unplanned and voluntary value co-creation behaviour (Yi & Gong, 2013; Yi *et al.*, 2011) emerge during immersive experiences in the hedonic SNSs of Instagram. Our holistic and multi-layered approach helps us to understand:

1. Interactivity as something socially and psychologically constructed due to the inter-subjective nature of a user's interactions with other users.

2. The patterns of unplanned and voluntary usage of engagement platforms with increased advocacy levels (Chung & Zhao, 2004) during customer citizenship behaviour (Ercsey, 2016).

3. The functioning of social mechanisms that leads to resource integration patterns (Singaraju *et al.*, 2016) of users' operant resources (Pera, Occhiocupo, & Clarke, 2016) during customer participation behaviour (Ajzen, 1991; Ercsey, 2016).

3.1.1. Coleman's bathtub applied to our study

We adopt the multi-layered C2C value co-creation model (Lindenberg, 1977; Wippler & Lindenberg, 1987) insofar as transformational rules respond to users' expectations by micro-macro level links. As shown in Figure 10, explanandum, which are descriptions of the macro-level outcome (e.g. node D), are derived from macro-level regularities or patterns (e.g. arrow 4) and from explanans that include: macro-level conditions (e.g. node A), *'bridge assumptions'* (e.g. arrow 1), *'expectations'* about the behaviour of individual users (e.g. arrow 2), and *'transformation rules'* (e.g. arrow 3) (Raub, Buskens, & van Assen, 2011:3). Therefore, node D represents explanandum, arrow 4 represents macro-level regularities that have a direct causal relevance on explanandum, and node A and arrows 1, 2 and 3 represent explanans that have indirect causal relevance on explanandum:

Explanandum follows from explanans due to (a) bridge assumptions, (b) expectations on individual behaviour, (c) transformation rules, and from (d) macro-level associations:

a) *'Bridge assumptions'* connect the macro- with the micro-level: the social context influences the motivations related to the choices between the different feasible scenarios presented to customers (Raub, Buskens, & van Assen 2011:3). Therefore, macro-to-micro relations represent customers' bridge assumptions (Lindenberg, 1981; Wippler & Lindenberg, 1987). Arrow 1 stands for bridge assumptions that imply value co-creation due to the actors' position in the network (Raub, Buskens, & van Assen, 2011).

b) *'Expectations'* on individual behaviour: node C symbolises the expectations about individual behaviour (Raub, Buskens, & van Assen, 2011) that is unplanned and voluntary. The micro-theory of individual behaviour patterns gives support to the indirect causal path represented in arrow 2.

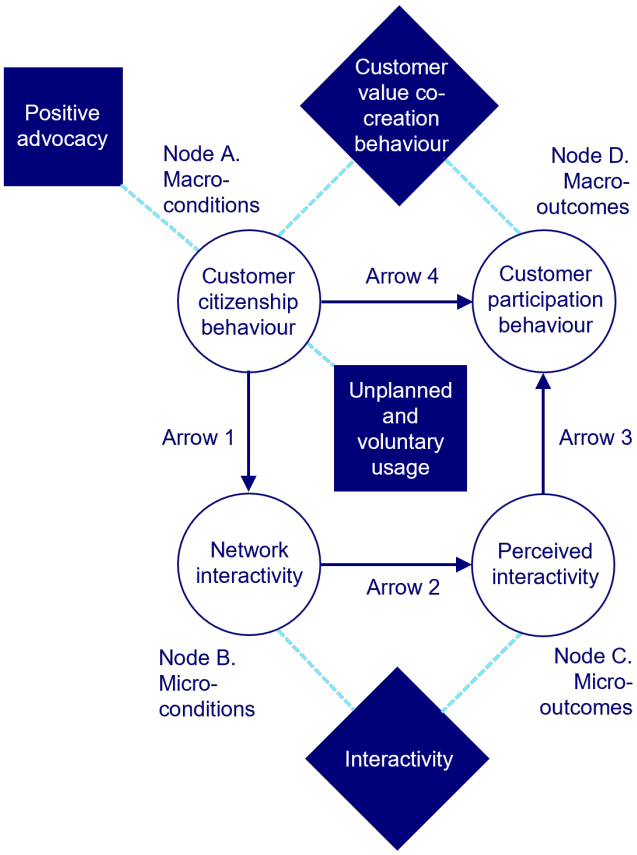
c) *'Transformation rules'* represent micro-to-macro relationships (Lindenberg, 1977; Wippler & Lindenberg, 1987). Arrow 3 denotes the rules on how expectations of the individual outcome at the micro-level generate macro-level outcomes (Raub, Buskens, & van Assen, 2011).

d) Macro-level associations capture how macro-level circumstances create macro-level effects in the direct causal path represented in arrow 4.

We build a conceptual model to determine that value is jointly co-created during unplanned and voluntary usage in hedonic SNSs such as Instagram. This unplanned and voluntary usage of hedonic SNSs is facilitated by increased advocacy levels when actors apply and integrate their personal operant resources during interaction with other users (Lusch, Vargo, & Gustafsson, 2016).

As shown in Figure 10, our conceptual model considers the direct and indirect relationships between the latent constructs of customer citizenship behaviour, customer participation behaviour, network interactivity and perceived interactivity. These activities entail different levels of value-cocreation and customer interactive behaviour (interactivity), in line with the concept of multi-layered C2C value co-creation behaviour (Ketonen-Oksi *et al.*, 2016; Rihova, Buhalis, Moital, & Gouthro, 2013).

Figure 10. Conceptual model



The conceptual model is in sync with the standard model that Coleman (1987, 1990) developed to represent micro-macro links, with nodes A, B, C and D and arrows 1, 2, 3 and 4.

To clarify Figure 10, we explain the options presented to users in nodes A, B, C and D, and in arrows 1, 2, 3 and 4.

- Node A represents the macro-conditions, i.e. the varied situations of a network of users of the hedonic SNS of Instagram in the context of a service ecosystem.

- Node B captures the micro-conditions, which are explanatory factors on the potential expectations in patterns of individual behaviour. This node represents assumptions about the options available to users of the hedonic SNS of Instagram, such as interactions with other users with positive, negative or none 'likes' or comments at all, as well as *'assumptions on the actors' incentives for choosing one of the alternatives'* (Raub, Buskens, & van Assen, 2011:3).

- Node C corresponds to the micro-outcomes, i.e. expectations about the individual actor's unplanned and voluntary (perceived) behaviour. It brings together the various responses available to actors for the stimuli presented in node B.

- Node D denotes the macro-outcomes and signifies whether users participate in resource integration of operant resources, or not, thus generating customer value co-creation behaviour.

- Arrow 1 illustrates how social conditions and assumptions related to networks and firms affect factors about possible alternatives that actors can choose from, such as opportunities or constraints, in node B. Arrow 1 denotes social conditions that influence an actor's information competences and motivate him or her to choose between possible alternatives. In other words, arrow 1 represents the context that influences how and why actors interact with other actors during interactivity practices. The institutional logics of a service ecosystem forms the basis for situational mechanisms. Actors' interactivity requires actors that interact with other actors and with interactive platforms that enable interaction.

- Arrow 2 captures the assumptions or expectations about regularities or patterns of behaviour of the individual actor between nodes B and node C, and it represents the assumption of equilibrium in the non-cooperative behaviour (Coleman, 1986) that studies rational choice theory (Raub, Buskens, & van Assen, 2011). Coleman (1990) assumed that arrow 2 represents the balance between the behaviour of actors, in which each user maximizes his or her own utility concerning the behaviour of another actor (Raub *et al.*, 2011).

- Arrow 3 describes expectations about how an individual actor behaves to produce macro-level outcomes, and it represents the transformation rule from the micro-outcome in node C to the macro-outcome in node D. Hence, arrow 3 shows the transformation rules that guarantee the macro-outcome. Our suppositions combine the macro-outcome in node D and the macro-level regularity that node D generates.

- Arrow 4 describes empirical regularities at the macro-level, between macro-conditions and macro-outcomes. Therefore, it represents the macro-level analysis of value co-creation that considers the institutional logics and arrangements of the service ecosystem in the effect of node A on node D. If the relationship between node A and node D exists, it is causal (Ylikoski, 2016).

3.1.2. Conceptual model with dimensions

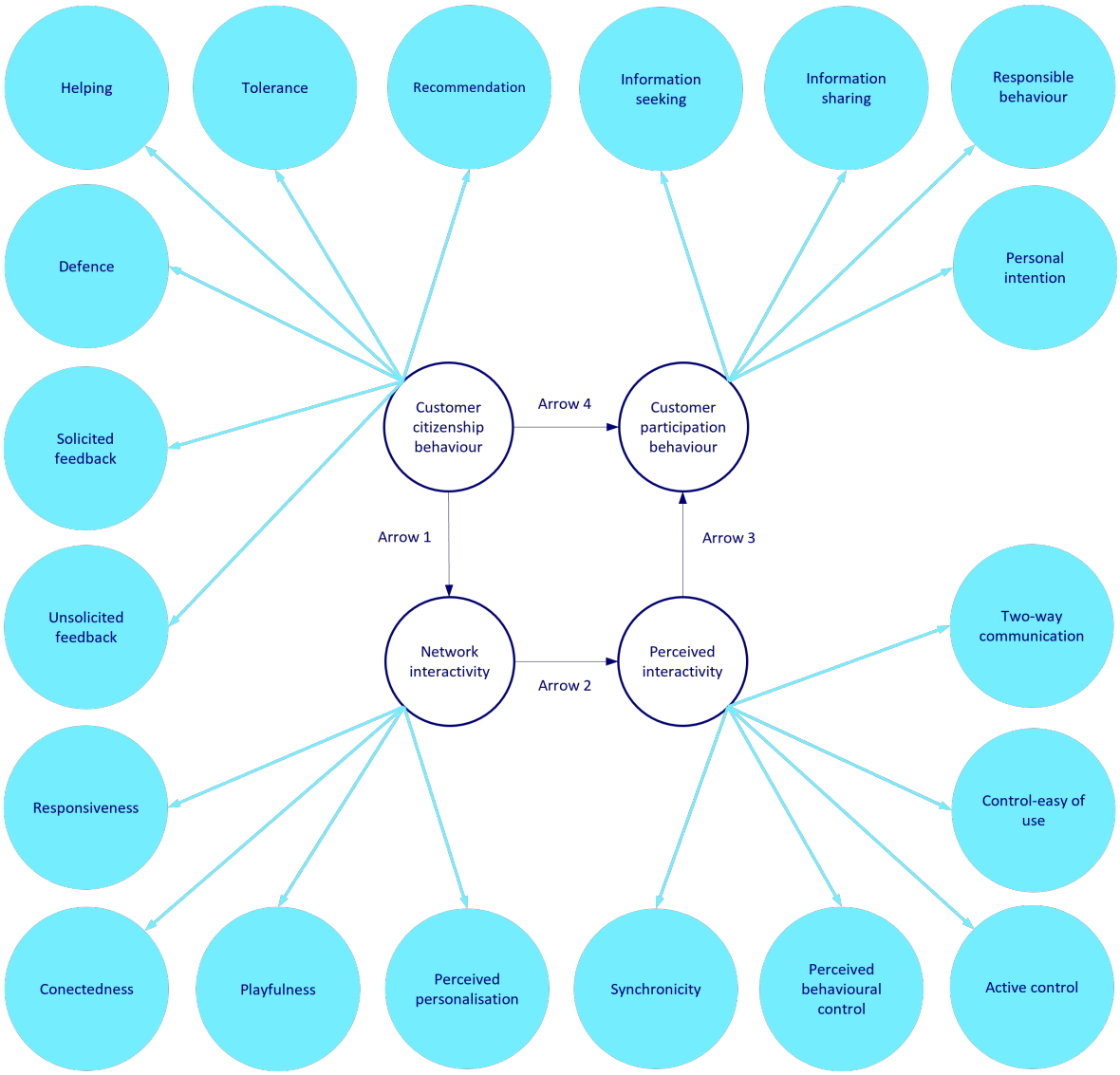
Figure 11 represents the adaptation of Coleman's bathtub (1990) for social interaction to our research and shows the constructs and dimensions included in our conceptual model.

1. A potential direct effect of customer value co-creation behaviour in Instagram, defined as facts of customer citizenship behaviour on customer participation behaviour (arrow 4).

2. An indirect effect of customer value co-creation behaviour on customer participation behaviour in Instagram, mediated by network interactivity firstly and by perceived interactivity secondly (arrows 1, 2 and 3).

3. A total effect of customer value co-creation behaviour in Instagram gathers the direct and indirect effects of customer citizenship behaviour on customer participation behaviour.

Figure 11. Constructs and dimensions in the conceptual model



In our conceptual model, network interactivity and perceived interactivity are each, exogenous and endogenous variables at the same time. There are also direct effects of customer citizenship behaviour on network interactivity and direct effects of network interactivity and perceived interactivity on customer participation behaviour.

As far as it is known, no previous research has analysed the social and psychological factors of the interaction amongst actors that underlie the unplanned and voluntary customer value co-creation behaviour in hedonic SNSs.

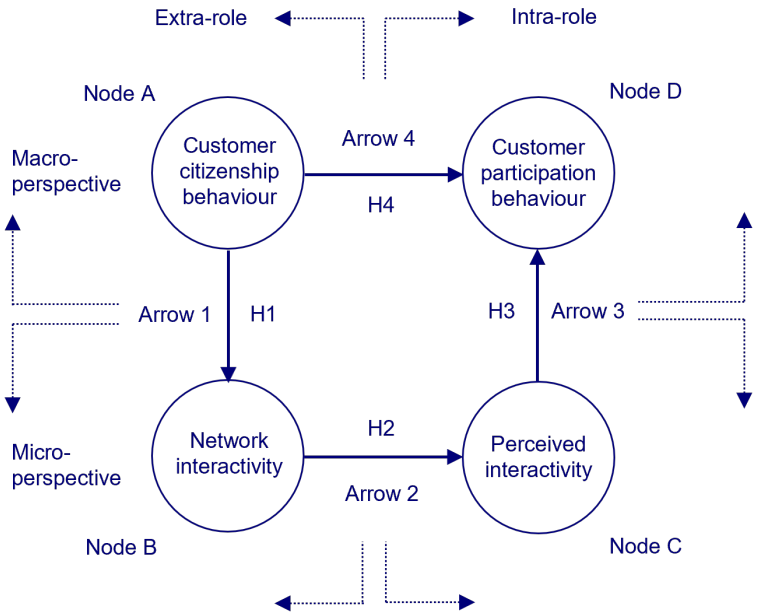
As described in chapter 2 (section 2.7.3), some authors (Amit & Zott, 2015; Bove *et al*., 2009; Encinas-Orozco & Cavazos-Arroyo, 2016; Ercsey, 2016; Groth, 2005; Mikalef *et al*., 2017) agreed with Yi *et al.* (2013, 2011) in the distinction between two types of customer value co-creation behaviour: (1) customer citizenship behaviour is the voluntary behaviour (extra-role), that has great value for any business or firm but is not a necessary requirement for the service and it contains dimensions unsolicited feedback, solicited feedback, defence, helping, tolerance and recommendation; and (2) customer participation behaviour is the necessary behaviour (intra-role) for the co-creation of value, and it contains dimensions information seeking, information sharing, responsible behaviour and personal intention.

Also, as reviewed in chapter 2 regarding interactivity (section 2.8.3), Zafiropoulos, Vrana, & Karystinaiou (2007) distinguished between (1) communication processes that focus on exchange and responsiveness (Rafaeli, 1988), which equates to the network interactivity of users (Rafaeli, 1988), and is compound of dimensions perceived personalisation, playfulness, connectedness and responsiveness; and (2) user's subjective perception of interactivity, which equates to the perceived interactivity of users (Steuer, 1992), and is made up of dimensions two-way-communication, control-ease of use, active control, perceived behavioural control and synchronicity.

3.2. Social mechanisms of resource integration and research hypothesis

In line with the social mechanisms (Coleman, 1990), we propose to validate a set of four hypotheses (*H1*, *H2, H3* and *H4*) represented in Figure 12 that hinge on resource integration of operant resources in the hedonic SNS of Instagram.

Figure 12. Conceptual model of value co-creation in Instagram



Legend: in blue, the causal paths derived from Coleman's bathtub model.

The institutional logics of a service ecosystem (Vargo, Wieland, & Akaka, 2015) create the conditions for users to interact with their resources in engagement platforms like Instagram, which are the situational mechanisms represented by arrow 1 in Figure 12. These situational mechanisms determine the influence of the context when users seek resources, that combined with the user's positioning in the network, lead to inter-activities with other users. These inter-activities can be described through observable interactivity characteristics (action-formation mechanisms shown in arrow 2 in Figure 12). As more users interact, since shared institutional logic creates the micro-conditions, new resource integration patterns appear that lead to value co-creation, which alter the existing configurations of users and resources (transformational mechanisms displayed in arrow 3 in Figure 12). Moreover, the shared institutional logic of a service ecosystem affects the internal disposition and the willingness of users to interact with intentionality during resource integration of operant resources in Instagram.

Consistent with the idea of the Coleman bathtub in Hedström & Swedberg's study (1998), we propose to identify the social mechanisms involved in users' interactivity that leads to customer value co-creation behaviour in arrows 1, 2 and 3, and in Diagrams 8, 9 and 10, which form a taxonomy of resource integration of operant resources. We also identify the macro-level associations in arrow 4, that are involved in customer value co-creation behaviour due to the institutional logics and arrangements of a service ecosystem (Vargo, Wieland, & Akaka, 2015):

- Arrow 1 refers to the proposed macro-micro connection present in situational mechanisms, the objective of which is to theoretically illustrate how macro-level circumstances affect users of interactive platforms at the micro-level. We propose that the situational mechanisms of resource integration work on three different types of operant resources: (1) relationships, that are activated by social influence or power to recommend; (2) knowledge, that is driven by user's perception of value, is activated by supportive activities such as feedback and defence; and (3) skills, that are operated by mental models of other users' behaviour.

An example of a mental model is the self-fulfilling prophecy, by which an individual's belief system is formed by his or her interpretation of a macro-condition that reinforces this macro-condition, such as false bank insolvency news in an economic recession and the individual's fears that the bank is insolvent (Merton, 1968).

Situational mechanisms of resource integration of operant resources in arrow 1 are the following (see Diagram 8):

1. *The network structure of actors based on supportive activities*. Customer citizenship behaviour affects users who create their network structure in conjunction with other users based on their personal supportive activities, such as unsolicited feedback, solicited feedback, defence, helping, and tolerance. Networks of users generate new value through their inter-connections (Lusch & Nambisan, 2015) when resource integration results in the emergence of new resources (Vargo & Lusch, 2004, 2008). The perception of value (Bidar *et al.*, 2016) depends on the user's position in the social network. *Furthermore*, the perception of value that results from customer citizenship behaviour is socially constructed and consumed by the actor to attain meaningful service experiences (Laud, 2015). The value perception characteristics (benefits) that derive from interactivity (Murschetz, 2011) are affected by the number of user's interactions with the network (Edvardsson *et al.*, 2011; Watson & Barros, 2016; Wang, Wang, Lin, & Abdullat, 2021). Thus, the network structure – i.e. the grouping quality of the network of actors – is an environmental factor (Edvardsson *et al.*, 2011) that indirectly contributes to customer participation behaviour (Shamim & Ghazali, 2014).

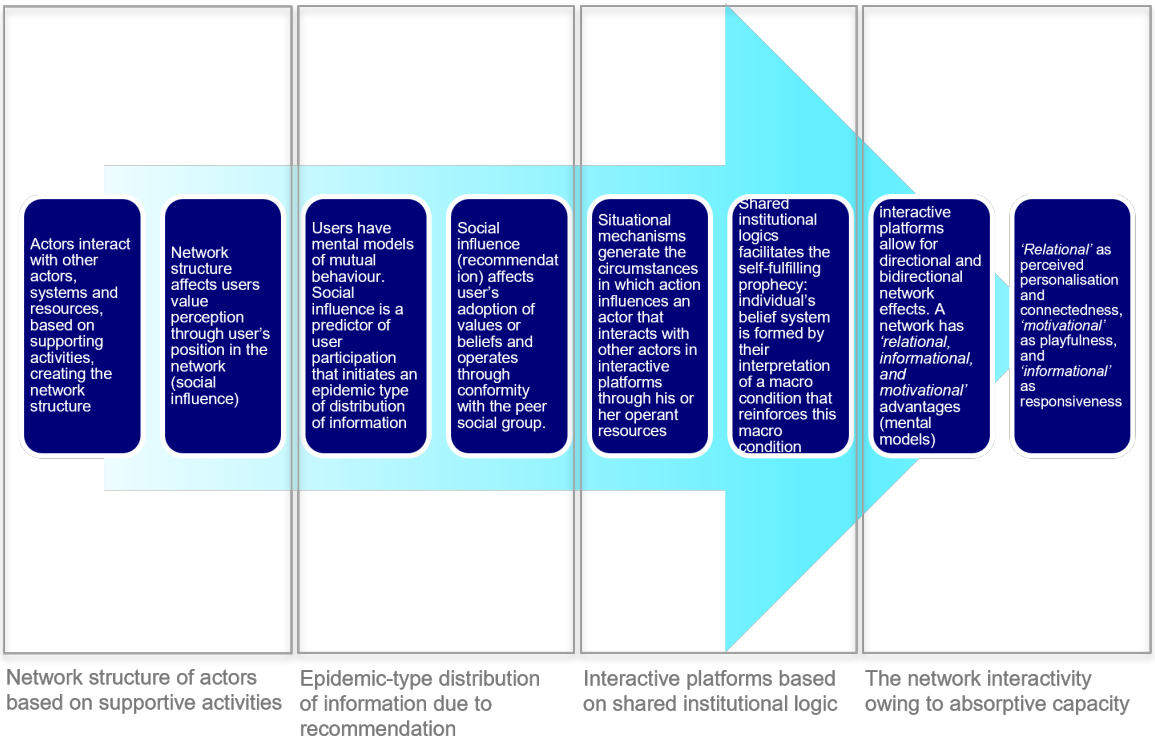
2. *An epidemic-type distribution of information due to social influence*. Customer citizenship behaviour affects the user who creates mental models of mutual behaviour (Edvardsson *et al.*, 2011; Vink *et al.*, 2020) in a shared network (Giuffre, 2013; Huang, Lin, & Wen, 2010). These mental models are manifested into reciprocal roles that are sustained over time as part of the service ecosystem (Bidar, Watson, & Barros, 2016). These mental models link the macro context with micro users' behaviour; hence, an individual actor is subjected to a particular social situation, or social influence, that will affect him or her in a certain way. Social influence, such as recommendation, can initiate an epidemic-type distribution of information, and to a lesser degree, behaviour and technology (Anagnostopoulos, Kumar, & Mahdian, 2008). *Moreover,* social influence (via recommendations) affects the individual user's adoption of *'values, attitudes, or beliefs'* (Hedström & Swedberg, 1998:23) following the self-fulfilling prophecy. Since social identity (group norm or enabler of behaviour) is stronger than internalisation (subjective norm or inhibitor of behaviour), then social influence operates through conformity with the peer social group (Li, 2011). The significance of social influence (recommendation) in the perception of user's value results indirectly in customer participation behaviour (Shamim & Ghazali, 2014) through relational factors (power to recommend).

3. *Interactive platforms based on shared institutional logic*. Situational mechanisms form the social context of the user of interactive platforms. These mechanisms explain how the macro-condition of customer citizenship behaviour, through which an actor interacts with other actors, affects: (1) social influence; (2) supportive

activities; and (3) resources, such as abilities (skills), relations (relationship) and information (knowledge). Therefore, situational mechanisms generate the circumstances in which action influences an actor that interacts with a network, through his or her operant resources (Hedström & Wennberg, 2017), due to the synergetic role of shared institutional logics in Instagram. *Moreover*, shared institutional logic facilitates indirectly the macro-condition of customer participation behaviour.

4. *The network interactivity is owing to absorptive capacity*. Due to the network effects of customer citizenship behaviour, actors can have directional and bidirectional network effects (Fu, Wang, & Zhao, 2017). An increase in the number of actors will increase: (1) the number of network effects; (2) the perceived value of the interactive platform; and (3) the number of resources to integrate. Therefore, an increase in the number of actors further develops the size of the platform. As more actors join an interactive platform, the network improves through *'relational, informational, and motivational'* advantages (Storbacka *et al.*, 2016:3011) that generate more mental models of user's behaviour. *Moreover*, the ability of a network of users to integrate resources through cognitive absorption (Balakrishnan & Dwivedi, 2021) is called absorption capacity. Todorova & Durisin (2007) identified three contingent factors that increase or decrease this capacity: (1) social integration (informational factors); (2) regimes of appropriability (motivational factors); and (3) power relations (relational factors). For this reason, we consider the relational, motivational and informational effects of the micro-condition of network interactivity through dimensions: *'relational'* as perceived personalisation and connectedness, *'motivational'* as playfulness and *'informational'* as responsiveness (Storbacka *et al.*, 2016:3011).

Diagram 8. Situational mechanisms in arrow 1



- Arrow 2 is the proposed micro-micro link present in action-formation mechanisms, which potentially allow us to understand how an individual user incorporate his or her network configuration during interactions and denotes the expected outcome of the actor's disposition to interact with another actor; these proposed action-formation mechanisms of resource integration lead to an actor's interactive C2C behaviour characterised by observable interactivity properties.

  In the classic example of bank depositors, the news of banks' bankruptcy provokes a reaction from depositors who fear the news of the banks' failure – depositors withdraw their deposit from the bank – leading to bank insolvency. As this action is repeated by other depositors (of funds), it strengthens the idea of banks' bankruptcy, partly due to the economically damaging bank withdrawals at the micro-level, and partly reinforcing the idea that the bank is wrong at the macro-level. This creates an iterative process of more withdrawals and a reduction in users' faith in the solvency of banks (Hedström & Swedberg, 1998).

  Action-formation mechanisms of resource integration of operant resources in arrow 2 are the following (See Diagram 9):

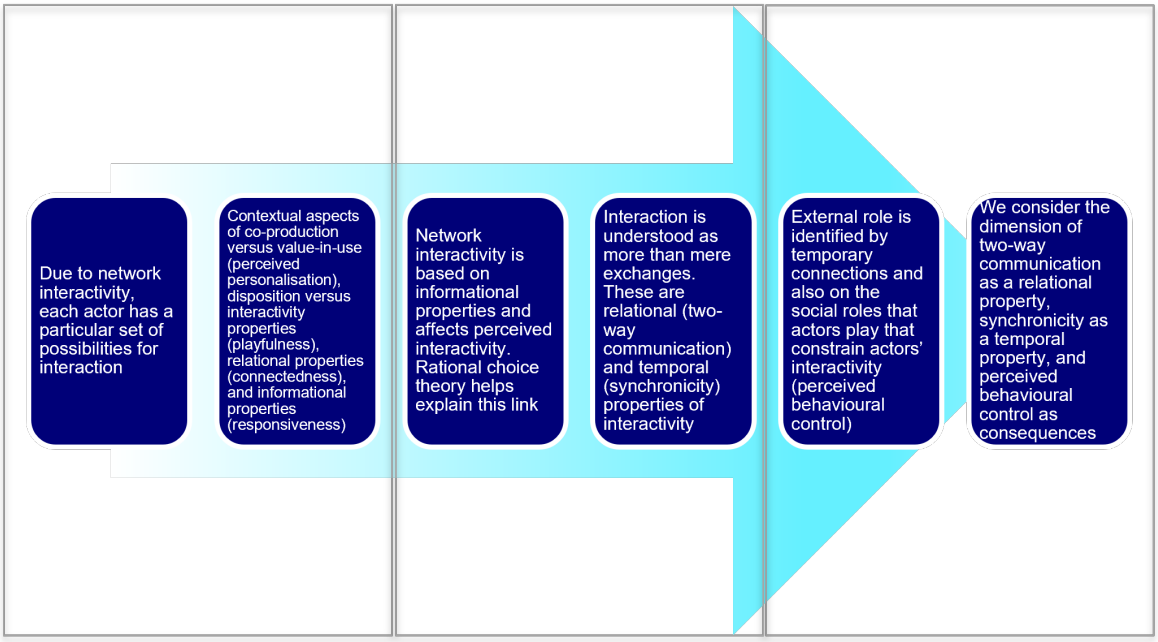
  1. *An actor disposition to interact is enabled by perceived personalisation, playfulness, connectedness and responsiveness.* As a result of the micro-condition of network interactivity, each actor has a particular set of possibilities for C2C interaction (actor's disposition) facilitated by the shared institutional logic of Instagram: to appropriate, reproduce, or innovate due to present connections. When these capacities are activated in response to a specific past event and directed towards a specific future (Chandler & Lusch, 2015), these lead to network interactivity properties, which have observable and measurable characteristics. *Moreover*, due to these, we consider four measurable factors related to network interactivity: the contextual aspects of co-production versus value-in-use interactivities (perceived personalisation), the relational properties (connectedness), the informational properties (responsiveness) and the disposition versus interactivity properties (playfulness). Therefore, actor (network) interactivity is understood as the actor's disposition to interact and the actor (network) interactivity properties.

  2. *Two-way communication and synchronicity are explicated through rational choice theory.* Network interactivity in hedonic SNSs like Instagram, is understood primarily as interactivity based on informational properties (responsiveness) where service exchanges involve like-for-like situations and decisions are taken by users based on information. The effects of network interactivity on perceived interactivity are explicated through rational choice theory (Favereau, 2005) and the prisoner's dilemma (Rasmusen, 2007). Users of the hedonic SNS of Instagram interact primarily with other users in like-for-like situations. *Moreover*, customers' interactions are considered in rational choice theory as conceptually and longitudinally more complex than mere exchanges. Interactivity is by definition behavioural, that is how motivations lead to manifestations directed at other users. We identify four types of interactive behaviour in service ecosystems in relation to informational properties of interactivity, such as: *'augmenting, co-developing, influencing and mobilizing behaviours'* (Jaakkola & Alexander, 2014:33). We identify both, the drivers and the value outcomes of such behaviour (Jaakkola &

Alexander, 2014; Verleye, Gemmel, & Rangarajan, 2014). These informational characteristics of perceived interactivity, explicated through rational choice theory, are the relational (two-way communication) and temporal (synchronicity) properties of interactivity.

3. *Perceived behavioural control of the communication medium is explicated in the theory of relational governance*. The external role of the actor is characterised by his or her temporary connections. This entails that actors' interactivity depends on the current connections (connectedness) that originated in the past and are oriented towards future service experiences. One of the main reasons for this is that connectedness stimulates protection and confidence into two-way communication and perceived behavioural control. In customers' minds, their closest circle of friends and family protects against bad brands and companies. Perceived personalisation, coupled with connectedness, brings dialogue (Ketonen-Oksi *et al*., 2016). Actors' interactivity depends not only on the current connections with other actors, but also on the social roles that actors play that constrain actors' interactivity (Chandler & Lusch, 2015). Actors' interactivity levels fluctuate between feedback, participation in co-creation and participation in self-service and outsourcing (Storbacka *et al*., 2016). *Moreover*, relational governance explicates how collaboration results in the integration of resources (Haase & Kleinaltenkamp, 2011; Heide, 1994). Since collaboration is voluntary, stakeholders must identify the benefit (perceived behavioural control) derived from participation and, if the benefit (relational and temporal) is not apparent, collaboration is not likely to occur (Haase & Kleinaltenkamp, 2011). These relational (two-way communication) and temporal (synchronicity) characteristics, together with the benefit that is explicated in the theory of relational governance (perceived behavioural control), are measurable dimensions of the perceived interactivity of the medium of communications.

Diagram 9. Action-formation mechanisms in arrow 2



- Arrow 3 denotes the proposed micro-macro connection of transformational mechanisms, which allows us to understand how the individual perception of the interaction with the medium creates macro-level effects that result in the integration of personal operant resources.

  In the bankruptcy case: *'contagion via correspondent networks and bank runs propagated the initial banking panics'* (Richardson, 2006:1). The characteristics of interactivity include the consequences of the actors' individual properties and the context that influences how, why, and when actors interact with other actors during resource integration practices. The varying network of actors with various degrees of disposition, such as the internal disposition of actors, and the various interactive platform properties, resulting from various resource integration pursuits, comprise the proposed elements of developing resource integration patterns, known as *choreography*.

  Transformational mechanisms of resource integration of operant resources in arrow 3 are (see Diagram 10):

  1. *Actor's behaviour by cause of control-ease of use, active control, and perceived behavioural control*. The effect of perceived interactivity on customer participation behaviour is explicated through the theory of planned behaviour (Ajzen & Sheikh, 2013). The theory of planned behaviour is the theory that links an actor's beliefs to his or her behaviour: we consider how a user's internal disposition affects his or her willingness to interact, which in turn establish his or her behaviour (Sahu, Padhy, & Dhir, 2020). To determine the intentionality of user's behaviour (actual

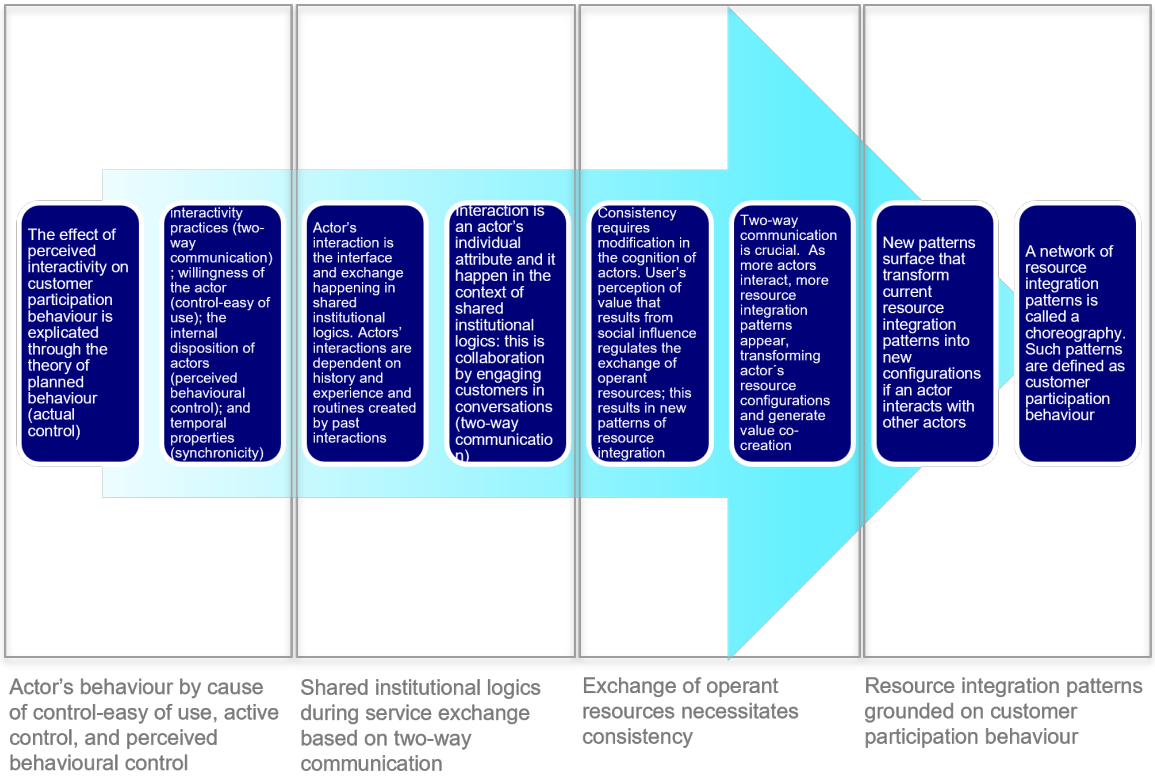
control), the theory of planned behaviour applied to resource integration supports: (1) interactivity practices (two-way communication); (2) the willingness of the actor (control-ease of use); (3) the internal disposition of human or machine actors (perceived behavioural control); and (4) temporal properties (synchronicity) (Sahu, Padhy, & Dhir, 2020).

2. *Shared institutional logic during service exchange based on two-way communication*. Actor-to-actor or C2C interaction, depends on the history and experience of past interactions and the routines created. The friendliness aspect of two-way communication generates personal intention and positive e-WOM (McMillan & Hwang, 2002). *Moreover*, since the interactivity of actors is governed through the institutional logics of a service ecosystem, actors' interactions do not occur in isolation, but in a context. This incorporates shared institutional logic, which contains: *'values, norms and governing principles'* of a service ecosystem (Storbacka *et al.*, 2016:3012), into C2C collaboration. Hedonic SNSs facilitate better collaboration by engaging customers in conversations (two-way communication) of individual and social value and knowledge (Sawhney *et al.*, 2005).

3. *Exchange of operant resources requires consistency*. Consistency requires modification in the cognition of actors (Monge & Contractor, 2003; Peters & Pressey, 2009). User's perception of value that results from social influence regulates the exchange of operant resources, resulting in new resource integration patterns (Bruce *et al.*, 2019). This process is due to the individual and relational (Arnould *et al.*, 2006) interactive behaviour of service *frontliners* (Hau, Tram Anh, & Thuy, 2017). *Moreover*, allowing the flow of information through a mutual friendly discourse (two-way communication) between humans and computers is vital for interactivity (Maglio, Matlock, Gould, Koons, & Campbell, 2002; McMillan & Hwang, 2002). Digital technologies enable human interaction by facilitating two-way communication (Beniger, 1987; Rudy Bretz & Schmidbauer, 1983; Duncan, 1989; Durlak, 1987; Garramone *et al.*, 1986; Kirsh, 1997; Rafaeli & Sudweeks, 1997; Zack, 1993) that is manifested in the control-ease of use, which in turn is manifested in perceived behavioural control. As more actors interact (conversation, feedback and the listening aspects of two-way communication), more resource integration patterns emerge that transform actor´s resource configurations into new configurations.

4. *Resource integration patterns are grounded in customer participation behaviour*. These transformational mechanisms occur because different resource integration patterns emerge, when existing resource integration patterns are transformed into new configurations of social capital. As the actors that interact with other actors change their internal disposition and willingness – since consistency requires modification in the cognition of actors – resource integration patterns evolve (Storbacka *et al.*, 2016) into new value configurations of social capital due to the intentionality of actors. *Moreover*, this study defines such patterns as customer participation behaviour with dimensions: information seeking, information sharing, responsible behaviour, and personal intention.

Diagram 10. Transformational mechanisms in arrow 3



- Arrow 4 is the proposed macro-macro link labelled macro-level associations, and it captures how macro-level circumstances create macro-level effects. These proposed macro-level associations, are pre-established and coded rules and tools through which social evidence produces macro-social outcomes, (e.g., structures and practices) of generic resource integration patterns. Due to the *'collective exchange'* (Benoit *et al.*, 2017:219), many customers access services and resources provided by a peer, leading to the cooperative exchange of these resources. For example, users exchange information, hoping that other users will mirror their behaviour (Wasko & Faraj, 2005). Furthermore, users contribute whenever they expect to obtain a return (Wasko & Faraj, 2005), such as a return of time, cost and satisfaction. Therefore, the network structure of actors, based on the supportive activities (unsolicited feedback, solicited feedback, defence, helping and tolerance) of customer citizenship behaviour, affect primarily responsible behaviour in customer participation behaviour, due to its ability to maintain its customer base (Revilla-Camacho *et al.*, 2015; Yi *et al.*, 2011).

  The organisational macro-level and the structuration perspectives (Phillips, Lawrence, & Hardy, 2000; Machado da Silva, Filho, & Rossoni, 2006) give the rules and resources that create collective collaboration and generates the *'context for the on-going processes of structuration that build and sustain the organisational fields of the participating actors'* (Storbacka *et al.*, 2016:3012). Governance mechanisms need pre-established and coded rules and tools that are encapsulated in the notion of institutional logics. Following the institutional logics, value configurations of actors use operant resources – which are embedded in a services ecosystem through institutional arrangements – to integrate their operand resources (Archer, 2000). This is macro-level theoretical reasoning, since resource integration practices of social capital that lead to generic resource integration

patterns of value co-creation are seen in the social context in which these practices are embedded.

To better understand, we consider customer participation behaviour from the perspective of the social motivation in customer citizenship behaviour. These macro-level associations, are pre-established and coded rules and tools of generic resource integration patterns in arrow 4, which are the following (see Diagram 11):

1. *Institutional logics and institutional arrangements that result in customer citizenship behaviour.* Macro-level associations of value co-creation are due to the institutional logics perspective of a service ecosystem. The Institutional logics establishes that the dominant logic, represented by the dimension of recommendation, influences the actor's decisions and choices (Thornton, 2002). *Moreover,* institutional arrangements at the macro-level are *'fundamental in understanding the structure and dynamics of value co-creation'* (Blaschke, Haki, Aier, & Winter, 2018:402). Value co-creation is based on civic behaviour during service-for-service collective exchanges in a platform – that can embed operant resources in a services ecosystem through institutional arrangements – and the dimensions that represent it are: unsolicited feedback and solicited feedback, defence, helping, and tolerance.

2. *Generic patterns of resource integration that are based on customer participation behaviour*. The effectiveness of collective service-for-service exchange to produce generic resource integration patterns, is determined by the dimensions present in customer participation behaviour: clarity of service exchanges (information seeking), exchange of information (information sharing), behaviour that is accountable (responsible behaviour) and friendly interpersonal relationships (personal intention). Based on the institutional logics and institutional arrangements, four steps related to generic resource integration patterns at the macro-level might occur (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016), that are ecosystem indifferent. They can also be a source of ideas for new business models (Parmar, Mackenzie, Cohn, & Gann, 2014).

    - Effectiveness of resource integration patterns in the creation of experiential value for the customer. The effectiveness of resource integration patterns can be evaluated against the institutional logics of a service ecosystem to improve the design of new patterns or identify novel patterns designed by others (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016).

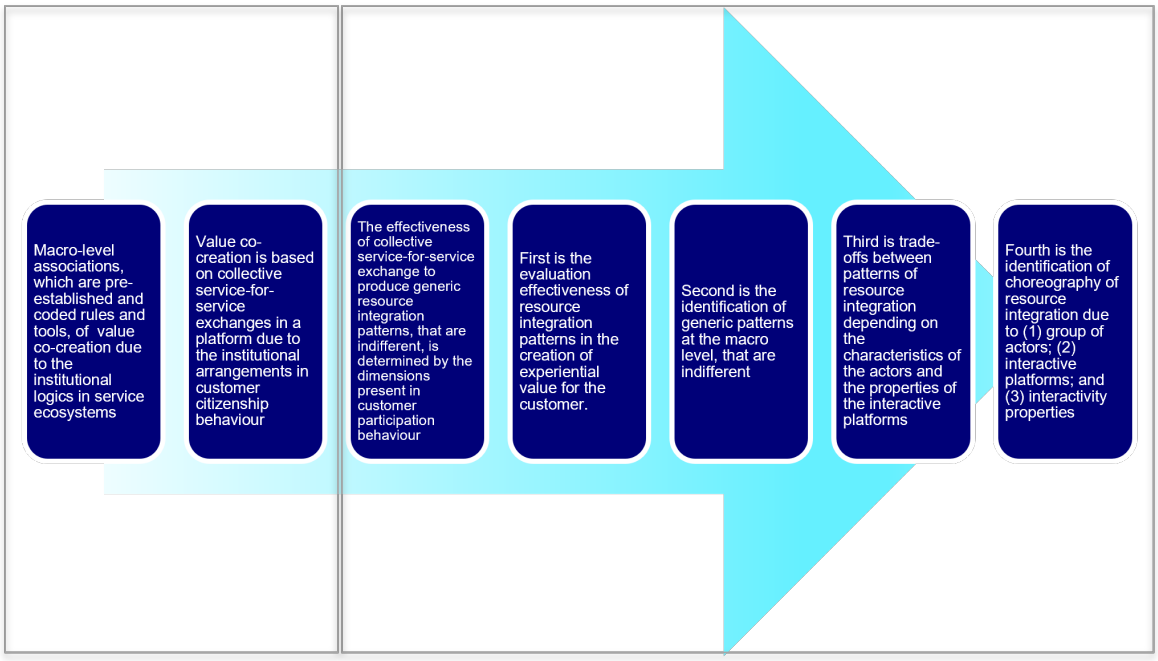
    - Identification of generic resource integration patterns at the macro level, that are platform indifferent (Parmar *et al.*, 2014). Identifying generic patterns of resource integration that are indifferent, like in the innovation of the data-driven business model, encapsulate more universal themes such as open innovation (Randhawa, Wilden, & Hohberger, 2016), the mobilisation of customer support and self-service.

    - Trade-offs between patterns. There are trade-offs between various patterns of resource integration, since each pattern depends on the characteristics of the actors and the properties of the interactive platforms

in any given situation. As the social exchange theory (Assiouras *et al.*, 2019) and *'collective exchange'* (Benoit *et al.*, 2017:219) explain, the benefits of each pattern are compared to inform actors about their choices of alternative patterns (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016).

- Choreography of resource integration. Generic resource integration patterns of collective service-for-service exchanges are the distinct result of the combination of three elements: (1) group of actors (relationships); (2) interactive platforms (knowledge); and (3) interactivity properties (skills) of social capital (Storbacka *et al.*, 2016; Wajid, Raziq, Malik, Malik, & Khurshid, 2019). This distinct combination is regarded a *choreography*.

Diagram 11. Macro-level associations, rules and tools in arrow 4



3.2.1. The effect of customer citizenship behaviour on network interactivity

The causal link in *H1* shown in Figure 12 represents the macro-micro connection and denotes the macro-condition of customer citizenship behaviour and the micro-condition of network interactivity. This proposed macro-micro path is shown as an arrow pointing downwards of the left side of Figure 12. This is the first arrow of the model and it represents the situational mechanisms of actors, systems and resources available to all actors during resource integration of operant resources in Instagram. The arrow relates to the following mechanisms: (1) the network structure of actors based on supportive activities; (2) an epidemic-type distribution of information due to

social influence; (3) interactive platforms based on shared institutional logic; and (4) the network interactivity owing to the absorptive capacity of a group of users. The social facts or the context represented by customer citizenship behaviour generates the micro-condition of network interactivity and the circumstances for the interaction between an actor and his or her network of contacts in Instagram.

Customer citizenship behaviour in Instagram is a voluntary behaviour, and it is comprised of social influence (recommendation) and supportive activities (unsolicited feedback, solicited feedback, defence, helping and tolerance). Examples of this behaviour are: recommending services to other people; a willingness to help and assist to other customers; or tolerating non-compliance (breaches) with the service when the brand does not respond quickly to their interest or does not provide what they need, want or expect (Yi & Gong, 2013; Silva *et al.*, 2016). In addition, customers freely perform activities that support the joint co-creation of value, such as unsolicited feedback, solicited feedback and defence.

The resulting network structure of actors is based on supportive activities that facilitate an epidemic-type distribution of information and social influence. Instagram enables the supportive and social functioning of shared institutional logic (Vargo, Wieland, & Akaka, 2015). Shared institutional logic facilitates the attainment of the self-fulfilling prophecy, by which an individual's belief system (e.g. social capital) is formed by their interpretation of a macro condition that reinforces this macro condition. The concept of absorption capacity (Todorova & Durisin, 2007) captures the ability of a network of users to integrate resources (skills, knowledge and relationships) through cognitive absorption (Balakrishnan & Dwivedi, 2021), and their effects are explained in the relational (perceived personalisation and connectedness), motivational (playfulness) and informational (responsiveness) factors that comprise the micro-condition of network interactivity. This leads us to state the following hypothesis:

***H1**: Customer citizenship behaviour has a positive influence on network interactivity.*

3.2.2. The effect of network interactivity on perceived interactivity

The causal link in *H2* shown in Figure 12 represents the proposed micro-level association and denotes the micro-outcome (perceived interactivity) of the micro-condition (network interactivity). The arrow 2 represents the action-formation mechanisms during resource integration of operant resources. They are due to the actor's rational choice and the subsequent relational governance mechanisms, that are involved in the role played by the individual actor that interacts with another actor in Instagram: (1) an actor disposition is enabled by perceived personalisation, playfulness, connectedness and responsiveness; (2) synchronicity (temporal) and two-way communication (relational) are based on rational choice theory; and (3) perceived behavioural control of the communication medium is explicated in the theory of relational governance. The action-formation mechanisms explain how the combination of individual desires, beliefs, and external events produces unique individual actions (Hedstrom & Swedberg, 1998), leading to resource integration's expected outcome.

The actor's interactivity is conceived as the disposition of an actor to interact based on shared institutional logic (internal) and the connections of actors due to the interactivity factors of the individual actor (external). This lead us to consider that actor's network interactivity factors, which

are observable, such as perceived personalisation, playfulness, connectedness and responsiveness, and generate the context (internal and external) for action-formation mechanisms to function. Coleman (1990) argued that action-formation mechanisms represent the balance between actors' behaviour, by which each user maximises his or her own utility, in relation to the behaviour of another actor (Raub *et al*., 2011). Rational choice theory and the prisoner's dilemma explain how users make choices during interactions with other users in like-for-like situations. Studies on social dilemmas, such as the prisoner's dilemma, confirm that rational and selfish behaviour leads to cooperation only when actors are involved in one-shot interaction: *'this refers specifically to much cooperative behaviour in one-shot social dilemmas'* (Raub *et al*., 2011:15).

Relational governance refers to how user collaboration regulation is achieved in perceived behavioural control (Heide, 1994; Haase & Kleinaltenkamp, 2011). Since collaboration is voluntary, actors need to identify the benefit obtained in the participation, and if the benefit is not apparent, then collaboration is not likely to occur. Hence, individual actors integrate the contextual conditions into a specific set of interactions with another individual actor, who seeks balance in relation to the behaviour of another actor. This balancing act, which results in temporal (synchronicity) and relational (two-way communication) properties, is coupled with protection. Additionally, perceived personalisation, coupled with connectedness, brings dialogue and confidence in the shape of perceived behavioural control (Ketonen-Oksi *et al.*, 2016). In other words, the belief in the benefit (perceived behavioural control) shapes the perception of the experience (two-way communication and synchronicity).

Based on these reasonings, we hypothesise the following causal relationship:

***H2**: Network interactivity has a positive influence on perceived interactivity.*

3.2.3. The effect of perceived interactivity on customer participation behaviour

The causal path in *H3* shown in Figure 12 represents the proposed micro-macro connection. The micro-level behaviour of perceived interactivity has an effect on the macro-level outcome of customer participation behaviour. The social mechanisms of resource integration are facilitated at the micro-level by an actor's agency, which interacts with other actors, due to shared institutional logic (Kleinaltenkamp *et al.*, 2012). This completes the necessary changes in the exchange of operant resources and, lead to resource integration patterns of social capital, during customer value co-creation. These are the transformational mechanisms shown in the third arrow: (1) an actor's behaviour by cause of control-ease of use, active control and perceived behavioural control; (2) shared institutional logic during service exchange based on two-way communication; (3) the exchange of operant resources, which necessitates consistency; and (4) resource integration patterns grounded in customer participation behaviour. Observable interactions at the micro-level of perceived interactivity generate social outcomes at the macro-level of customer participation behaviour. As many actors interact simultaneously, more resource integration patterns emerge that transform existing configurations of actors and resources into new configurations.

Perceived interactivity affects customer participation behaviour through the motivations described in the theory of planned behaviour, which are trust (responsible behaviour) and emotions (personal intention) such as respect, kindness and civility and not only through the intentionality of actors

(actual control). Moreover, online communities facilitate immersive experiences and better collaboration by engaging individual customers in conversations (two-way communication) with individual and social value because of a shared institutional logic helps to obtain personal and social knowledge (Sawhney *et al.*, 2005). These motivations comprise the preconditions and conditions for customer participation behaviour as explained in the theory of planned behaviour. Therefore human or machine actors' internal disposition (perceived behavioural control) affects actors willingness (control-ease of use), which in turn affects actor's intentionality (actor control) during interaction with the medium of communication given that interactivity properties (two-way communication) and time-based practices (synchronicity) are facilitated (Lim & Weissmann, 2021; Rubio *et al.*, 2019).

Whether intentional or unintentional, actors' interactions *'are transformed into some kind of collective outcome'* (Hedström & Swedberg, 1998:23), i.e. resource integration patterns. Such collective outcome is defined as customer participation behaviour, and is made up of the dimensions: information seeking, information sharing, responsible behaviour and personal intention. Accordingly, we assume that:

***H3**: Perceived interactivity has a positive influence on customer participation behaviour.*

3.2.4. The effect of customer citizenship behaviour on customer participation behaviour

The link in *H4* shown in Figure 12 refers to the proposed macro-macro link. Thus, arrow 4 represents the macro-primary justification of the service-dominant logic, in which the macro-condition of customer citizenship behaviour affects the macro-outcome of customer participation behaviour. The effect of the unplanned and voluntary extra-role of customer citizenship behaviour on the intra-role – such as innovator, competence, co-producer, promoter or even partial employee – of customer participation behaviour is the macro-level association of customer value co-creation behaviour. This is due to (1) the institutional logics and the institutional arrangements that are present in customer citizenship behaviour; and (2) the generic patterns of resource integration of social capital that are present in customer participation behaviour.

Customer citizenship behaviour is the unique role of customer social motivation in promoting the occurrence of customer participation. This is because social information related to the structural positions of actors during civic behaviour affects the psychological advice selection criteria of actors in a friendship or trusted network (Bidar *et al.*, 2016). Civic behaviour, which is a combination of social processes, such as social influence (recommendation), and supportive activities (unsolicited feedback, solicited feedback, defence, helping and tolerance) influences the participation of customers in activities with other customers, such as collective service-for-service exchange (Benoit *et al.*, 2017) of operant resources.

Customer participation behaviour are the individual actions and processes (Bendapudi & Leone, 2003) involved in the co-production, co-design or co-delivery of goods and services during the cooperative activities aimed at (information seeking, information sharing, responsible behaviour and personal intention) the collective exchange of services. The collective service-for-service exchange has several components: customers (relationships), peer provider (skills) and platforms (knowledge). The goal of this exchange is to gain temporary access to tangible and intangible resources embedded in a service ecosystem through the institutional arrangements presented in

the supportive activities of customer citizenship behaviour. The exchange is not market mediated, but it relies on the social processes of generic resource integration of operant resources.

Social exchange theory (Assiouras *et al*., 2019) and the concept of *'collective exchange'* (Benoit *et al.*, 2017:219) deliver a theoretical foundation to embed the identification and effectiveness of generic resource integration patterns of social capital at the macro-level of customer value co-creation behaviour. Therefore, based on the supportive activities of customer citizenship behaviour, the network structure of actors affects primarily responsible behaviour in customer participation behaviour, due to its ability to maintain its customer base (Revilla-Camacho *et al.*, 2015; Yi *et al.*, 2011). We consider that these generic resource integration patterns result in a distinct combination of a group of actors (relationships), interactive platforms (knowledge), and interactivity properties (skills) of social capital, that are indifferent. This distinct combination is regarded as a choreography.

***H4**: Customer citizenship behaviour has a positive influence on customer participation behaviour.*

Chapter 4. Methodology and results

This chapter describes the SEM quantitative methodology and the different phases carried out in developing the measurement model, the structural model, and testing the hypotheses to validate the final model.

The chapter has four parts: (1) the description of the SEM; (2) the construction and validation of the measurement model using the survey sampling method, the data collection method, the measurement scales and the confirmatory factor analysis (CFA), including the possible effects of common method variance (CMV) (Rodríguez-Ardura & Meseguer-Artola, 2020); (3) the testing and validation of the analytical structural model; and (4) the discussion of the hypotheses test according to the data collected that leads to the verification of the final model.

4.1. SEM

We develop and test a SEM of the causal relationships between the constructs of customer citizenship behaviour and customer participation behaviour, which is mediated by network interactivity and perceived interactivity during the unplanned and voluntary usage of the hedonic SNS of Instagram. The study of the direct and indirect relationships in the proposed model is carried out through a series of multivariate statistical techniques, of which the most outstanding is the SEM analysis (Schreiber, Nora, Stage, Barlow, & King, 2006).

SEM is a confirmatory approach (that is a hypotheses test) to analyse a structural theory. In general, this structural theory encapsulates causal mechanisms that produce observations in multiple variables (Byrne, 2010), and it minimises the adjustment between the structural theory and the observed variables. Beran & Violato (2010) stated that this process estimates how the model fits the data: this is the adjustment of the latent variables path models resulting in a reduction of the differences between the covariance of the data and the model.

We consider SEM as the combination of CFA and multiple regression, since SEM is a confirmatory technique, but it is also exploratory. Compared to CFA, SEM deepens the relationship between latent variables and consists of two components: a measurement model (on which we perform CFA) and a structural model (Schreiber *et al.*, 2006). Additionally, we discuss sample issues such as size, normality, outliers, linearity and multicollinearity. We also address the software program employed (SPSS Amos version 25), which should analyse continuous data and the estimation method employed that is affected by sample issues.

Finally, the graphical representation depicted in Figure 12 shows a conceptual model tested to establish the degree to which it corresponds to the observed data. A series of mathematical equations illustrate the relationship described beforehand. However, the introduction of these equations goes beyond the scope of our research. Therefore, we refer to Long (1983a, 1983b) and Ullman (2001), who described the mathematical equations involved in CFA and SEM (Schreiber *et al.*, 2006).

4.2. Survey sampling method

The sample size is the single most important feature to assess the fit of the model (Iacobucci, 2010); the second relevant quality is the number of dimensions in each construct that affects the reliability of the model. We aim to demonstrate that our sample size is sufficient to provide for a good model fit. We first use the Westland formula (Westland, 2010:478) to estimate the minimum

sample size in relation to the density of the model (this is $n \geq 50r^2 - 450r + 1{,}110$) where *r* is the relation between indicators and latent variables. Since our model has 19 (latent) variables and has 80 indicators, of which only 45 are used for calculations (as shown in section 3.3):

$r = {}^{45}/_{19} = 2.37$, thus

$n \geq 50 \times 5.62 - 450 \times 2.37 + 1100 \geq 281 - 1{,}066.5 + 1{,}100 \geq 315$ observations

$n \geq 315$ observations

Therefore, 315 observations are the minimum required number of complete responses to our questionnaire, to achieve the lower limits on the sample size to use SEM (Schreiber *et al.*, 2006).

We also take into account: *'five considerations affecting the required sample size for SEM'* (Hair, Black, Babin, & Anderson, 2014:573-574), which are the following:

1. The more the data deviate from multivariate normality, the more likely the ratio increases to 15 respondents per parameter. Since we have 19 variables, the minimum required is 285 observations.

2. Since we use maximum likelihood estimation, the recommended sample size varies between 100 and 400 observations. Because we have no missing data and a sampling error of 4.90%, (described in section 4.3), which is below the recommended 5.00%, our sample size could be as small as 50 observations.

3. Because our model is complex, due to a large number of variables (19), we require a large sample size to ensure, at least: *'one more observation that the observed covariances'* (Hair, Black, Babin, & Anderson, 2014:573-574).

4. As we exhibit no missing data, we do not require a large sample size.

5. To address average error variance, we examine the communality of indicators that: *'represent the average amount of variation among the measured/indicator variables explained by the measurement model'* (Hair, Black, Babin, & Anderson, 2014:573-574). We calculated it as the square of the standardised loadings estimates of constructs. As we will see in section 4.5.3, it is equal to 0.92 and is well above the minimum 0.70 for standardised loadings.

Based on the above discussion, the minimum sample size is 300 observations. However, we use a minimum of 400 observations. This threshold of 400 results from applying the *five-times rule,* and it corresponds to the recommended number of valid questionnaires needed to perform the SEM analysis – considering the number of 80 items in the questionnaire for 19 factors of the initial conceptual model.

We could not reach the entire population of our research because Instagram does not provide information about its users. This prevented us from using a probability method for sampling, as it requires prior information from the sampling frame (Deming, 1990).

Since the quantitative survey in our research requires adequate samples of Instagram users, we decided to use the snowball sampling method to recruit participants for our online survey. This

method: *'consists of identifying respondents who are then used to refer researchers on to other respondents'* (Atkinson & Flint, 2001:1). Compared to probabilistic sampling methods, it requires a larger number of responses (Baltar & Brunet, 2012).

4.2.1. Snowball sampling method

Firstly, we identified Instagram users that we could easily locate to contact them directly (Babbie, 2011). Thus, our personal contact list in Instagram formed the first group of contacts. Next, they were requested to fill in an online survey, with constructs and research questions revised by my doctoral thesis supervisors, Dr. Inma Rodríguez-Ardura and Dr. Antoni Meseguer-Artola.

We sent generic online invitations to participate in one-time surveys and trusted that the casual recipients of the invitation would respond. We asked all respondents in the initial group to provide some additional Instagram user contacts from their own contact list, so that the snowball begins. We targeted users with large contact lists.

Secondly, to continue the snowball effect, the contact list was expanded to include new groups of Instagram users, which were added to the first group. As a result, we counted four waves of additional Instagram groups that volunteered to respond.

Since sampling is considered crucial in quantitative analysis, we used the snowball sampling technique based on the literature (Schillewaert & Meulemeester, 2005; Wright, 2005). This method is appropriate when the objective is to understand the theoretical relationships, the underlying mechanisms and the generalisation of the results to the population (Speklé & Widener, 2018).

However, snowball sampling problems may impede the ability to derive generalisations based on the findings. To prevent these issues, we considered the following:

- The quality criteria for data collection assesses the accuracy, precision, reliability and validity of the quantitative methods used and whether consistent results of the same measure are obtained. Accordingly, we re-tested with 15 cases during the design phase of the questionnaire using different measures for the same constructs in the online survey, even though we risked boring people if they felt that too often the same question was reformulated. This method is only valid if it truly reflects the concepts and constructs that are measured (Babbie, 2010).

- Self-selection bias is an additional difficulty to tackle when conducting online snowball sampling research (Stanton, 1998). This means that some users might participate more actively on Instagram than others and thus are more likely to fill in the online survey, which could lead to a method of self-selection. This potential bias was assessed, ex-post, in section 4.3 and Table 5.

- Some Instagram users might become insensitive to the call to participate in the survey if they perceive the request to complete it as another marketing technique (because these marketing techniques pay the operating costs of SNSs). If this happens, they might not participate in the survey.

In fact, presenting a sampling frame for online social networks has several challenges. Some researchers have proposed to elaborate a sampling frame by listing the participants in an online

community and sequentially counting participants in a specific time period[52]. However, the flow of communication in SNSs like Instagram makes it difficult to use a stable, consistent and reliable sampling frame. SNSs work differently from offline networking platforms because the latter usually build user lists accessible at the request of board members.

Other sampling techniques are possible, but they require much more planning, time, and resources beyond our reach. Our experience with online surveys is that snowballing provides the least problematic sampling method, since it only requires requesting contacts, upload contact details, and sending online requests for answers to the questionnaire.

Online surveys are possibly the most common: *'used form of data collection via the internet'*. Schillwaert *et al.* (2005:165) further argued that, similarly to offline sampling, online sampling could be non-probabilistic as well as probabilistic: *'just as is the case in the traditional world, probability as well as non-probability sampling could be used'* (Schillewaert & Meulemeester, 2005:165).

4.3. Data collection method

The fieldwork was conducted from January to April 2019, and in accordance with Descombe's (2012). The questionnaire was distributed using the online business survey tool *SurveyMonkey*; it was self-administered and offered in two languages (English and Spanish) through Instagram.

Our sample frame consisted of national and international people over 18 years old, who used Instagram at least twice a week for a minimum of ten minutes a week in the previous month of our fieldwork. For example, a report on the daily usage of Instagram found that the average user spent 1.70 minutes per day on Instagram (Oxford Business Group, 2016:175).

We collected 415 complete online surveys. If we consider a universe size greater than 100,000, with a confidence level of 95% (which is common), and we assume a maximum uncertainty $p = q = 0.50$, we obtain a margin of error of 4.90% (below 5.00%), which allowed us to work with a confidence level of 95.53% for a sample error of 5.00%. Table 5 shows the values of the most relevant sociodemographic variables of the sample.

Due to the extent of the questionnaire, it was expected that more than 50% of the people would abandon the survey, failing to complete the questionnaire. Therefore, to get the minimum of 400 observations, we needed to persuade at least 800 individuals to start and complete the questionnaire:

1. We launched a pilot survey for 15 Instagram users to evaluate the readability and consistency of the questionnaire and the time that is required to complete it.

[52] Due to data protection laws, hedonic SNSs, such as Instagram, can provide neither memberships lists nor sampling frames. Online communities are not dependent on fees, but on shared interests, and they require little information from new members. They are typically maintained at advertising fees, so the privacy of member's data is an issue when asking online communities for lists of members. Because of this, Wright (2005) argued that online research might have issues with sampling (Andrews *et al.*, 2003; Howard, Rainie, & Jones, 2001). An additional issue is that the demographics of users of online communities might be poorly understood (Dillman, 2000; Stanton, 1998), even if users provide their own demographic information, this information might not be correct.

2. We launched the online survey for Instagram users through a personal contact database of more than 5,000 Instagram contacts with a link to the *SurveyMonkey* website, where access was given to complete our custom-designed survey.

3. The questionnaire consisted of 80 questions (divided into six sections), all analysed in this study. Our survey is still available at: https://es.surveymonkey.com/r/B35X9L6 in English, and at https://es.surveymonkey.com/r/B35X9L6?lang=es in Spanish. Also, our complete questionnaires in English and Spanish are shown in Appendices 1 and 2.

4. The survey included eight questions that requested sociodemographic information (Barron & Jupp, 2006). The value of these sociodemographic variables was used in the *ex-post* analysis of representativeness (presented in section 4.3).

In total, 866 participants filled-in the survey, of which only 415 completed the questionnaire. We reject all the incomplete data sets by eliminating all cases in which one or more answers were omitted. This resulted in a sample containing 415 validated questionnaires for our study. The analysis of the missing data shows that each of these 415 questionnaires is completed, with no missing responses – so the problem of missing data can be ignored. Therefore, we have reached our objective to get at least 400 complete responses, our suggested minimum limit for the sample size.

The synopsis of the sample is shown in Table 5. The sample was made up of Spanish instagrammers (65.00%), followed by users of other countries (35.00%). Most of them were male (58.50% men versus 41.50% women), with a university education (78.75%). Users spent more than 3 hours on average per day (26.00%) in Instagram. Most respondents used a smartphone to access Instagram (96.40%), and had more than 400 followers (54.20%)[53].

Table 5. Sample profile of the respondents

Variables	Values	Percentages
Gender		
	Male	58.50%
	Female	41.50%
Level of education		
	None	0.00%
	Primary	1.75%
	Secondary	19.50%
	University	78.75%
Age*		

[53] In our sample, the most common segment was that of men with higher education, from 45 to 54 years old (15.50% of the total sample) and 35 to 44 years old (13.75%). The next segment consisted of women with higher education between 45 and 54 years old (11.75%) and men from 25 to 34 years old (9.50%).

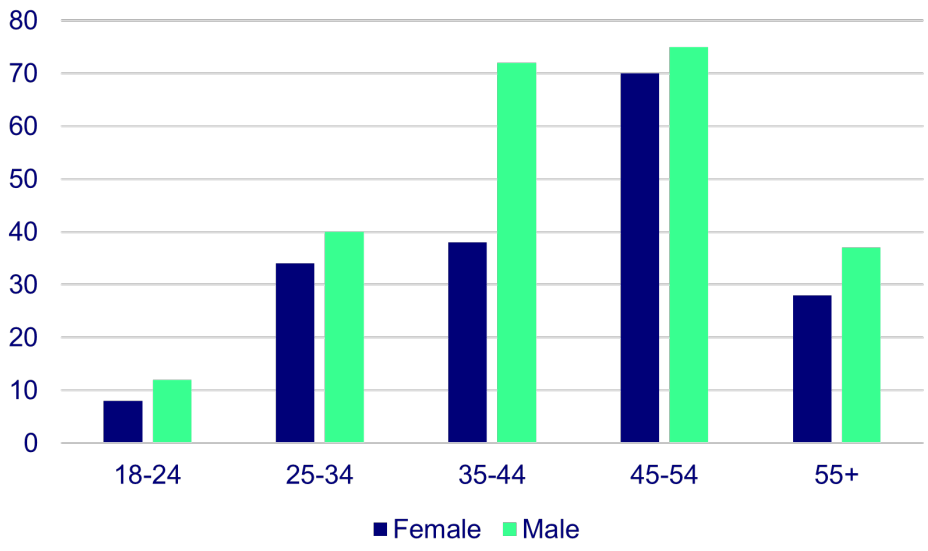
Variables	Values	Percentages
	18 to 24	5.81%
	25 to 34	18.26%
	35 to 44	29.77%
	45 to 54	31.98%
	More than 55	13.72%
Nationality		
	Spanish	65.00%
	Others	35.00%
Time spent per day on average the previous week		
	10 to 30 minutes	20.70%
	31 to 60 minutes	18.80%
	1 to 2 hours	20.70%
	2 to 3 hours	12.80%
	More than 3 hours	26.00%
Device used to access Instagram (non-cumulative)		
	Computer	15.02%
	Tablet	18.80%
	Smartphone	96.40%
	iPod	2.20%
	Digital camera	0.00%
	Game console	0.00%
	Music and video player	0.20%
	Smart TV	0.00%
Number of followers		
	Less than 11	2.70%
	11 to 50	12.00%

Variables	Values	Percentages
	51 to 100	5.10%
	101 to 150	6.30%
	151 to 200	5.30%
	201 to 250	5.10%
	201 to 300	3.10%
	301 to 400	6.30%
	More than 400	54.20%

* Under 18 years old is a non-valid answer.

In our sample, the most populous age group was 45 to 54 years old (31.98%), followed very closely by the 35 to 44 age group (29.77%), and the 25 to 34 age-group (18.26%). This is probably because the average age of the first snowball layer – this is the researcher's contact list – coincides with the average age of the first group in the sample. A 53.84% of the profiles were between 18 and 44 years old (see Figure 13).

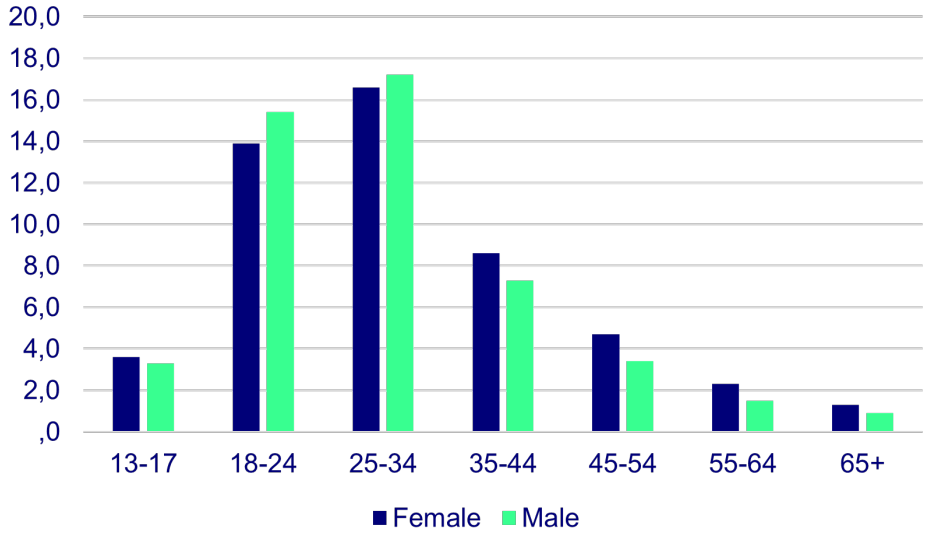
Figure 13. Instagram: distribution of sample audiences, by age and gender



Source: own calculations.

The main difference between the sample and the average global audience user group is in the age criterion, as the most common global audience user group is 25-34 years old (33.80%), according to Statista (2021b). In fact, 79.00% of the global audience profiles are between 18 and 44 years old.

Figure 14. Instagram: distribution of global audiences, by age and gender



Source: Statista (2020).

In our study, we consider that the most significant variables to study customer value co-creation behaviour and interactivity are: education, time spent per day, number of followers and gender (Clark, Fine, & Scheuer, 2017; Huang & Su, 2018) (see Figure 14). However, we do not have population data for the first three variables. Therefore, we cannot carry out a complete ex-post representativeness analysis, and the possible extension of the results obtained for the sample cannot be directly generalised to the entire population.

4.4. Measurement scales

The four central constructs in Figure 11 are latent second order constructs. In other words, they are reflective constructs (Bollen & Diamantopoulos, 2017; Henseler, 2017) defined from first order latent constructs also presented in Figure 11, which in turn we measure by selected scales adapted from previous relevant research.

To carry out the survey, we first selected the scales[54] that researchers had put previously into practice in different relevant contexts of the service industry and have been validated empirically. Second, we adapted these scales to our specific research context. Third, we translated the scales into Spanish to distribute the survey in both English and Spanish.

Table 6 shows the nature and origin of the measurement scales we adapted to the use of Instagram. The 7-point Likert-type scales (ranging from either 'strongly disagree' to 'strongly agree') were used in all response items. In addition, reversed scale items in the questionnaire were included to detect unwanted automatic response patterns.

[54] Yi & Gong's (2013) value co-creation behaviour's scale is the most empirically tested to date by scholars, in a diversity of countries and environments, to ensure its validity and reliability. Yi & Gong (2013) discussed how the measurement scales: (1) fit with the various descriptions of value developed under the service-dominant logic; (2) are conceptually sound and psychometrically reliable; and (3) are consistent, reliable and nomologically valid.

Table 6. Operationalisations of constructs: measurement scale for customer value co-creation behaviour and interactivity

Constructs	Original scales´ sources	Adapted questionnaire scales
Customer citizenship behaviour		
Unsolicited feedback (UFE*i*)	(Ercsey, 2016; Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Yi & Gong, 2013; Kwon, 2015)	(UFE1) If I have a useful idea on how to improve an Instagram service, I let the social network site know. (UFE2) When I receive good service from Instagram, I comment on it. (UFE3) When I experience a problem, I let Instagram know about it.
Solicited feedback (SFE*i*)	(Ercsey, 2016; Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Groth, 2005)	(SFE1) If solicited, I fill out a customer satisfaction survey. (SFE2) If solicited, I provide helpful feedback to an Instagram community manager. (SFE3) If solicited, I provide information when surveyed by Instagram. (SFE4) If solicited, I Inform Instagram about the great service received by an individual community manager.
Defence (DE*i*)	(Ercsey, 2016; Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Yi & Gong, 2013; Kwon, 2015)	(DE1) I said positive things about Instagram and their followers to others. (DE2) I recommended Instagram and their followers to others. (DE3) I encouraged friends and relatives to use Instagram.
Helping (HE*i*)	(Ercsey, 2016; Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Yi & Gong, 2013; Kwon, 2015)	(HE1) I assist other users if they need my help. (HE2) I help other users if they seem to have problems. (HE3) I teach other users to use the service correctly. (HE4) I give advice to other users.
Tolerance (TO*i*)	(Ercsey, 2016; Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Yi & Gong, 2013; Kwon, 2015)	(TO1) If Instagram's service is not delivered as expected, I would be willing to accept it. (TO2) If Instagram makes a mistake during service delivery, I would be willing to be patient. (TO3) If I have to wait longer than I usually expect to receive the Instagram service, I would be willing to adapt.
Recommendation (RE*i*)	(Ercsey, 2016; Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Groth, 2005)	(RE1) I refer fellow students or co-workers to Instagram. (RE2) I recommend Instagram to my family. (RE3) I recommend Instagram to my peers. (RE4) I recommend the social networking site to people interested in Instagram's products/services.
Network Interactivity		
Perceived personalisation (PP*i*)	(Wu, 2006)	(PP1) I felt I just had a personal conversation with a sociable, knowledgeable and warm user from Instagram. (PP2) It was like Instagram was talking back to me while I clicked through. (PP3) I perceived Instagram not to be sensitive to my needs for service information (reverse coding)*.
	(Leiner & Quiring, 2008)	(PP4) I perceived Instagram to enable me to choose and

Constructs	Original scales´ sources	Adapted questionnaire scales
		learn the content I need. (PP5) I felt Instagram can make me feel that I am a unique user.
Playfulness (PL*i*)	(Ling Zhao & Lu, 2012; Hsu & Chiu, 2004)	(PL1) I think using the Instagram service is interesting. (PL2) I think using the Instagram service is enjoyable. (PL3) I think using the Instagram service is exciting. (PL4) I think using the Instagram service is fun.
Connectedness (CONN*i*)	(Zhao & Lu, 2012; Lee, 2005; Leiner & Quiring, 2008)	(CONN1) Users of the Instagram service share their experience and feelings with others through this communication tool. (CONN2) Users of the Instagram service benefit from the user community using this service. (CONN3) Users of the Instagram service share a common bond with other members of the user community who are using the service.
	(Leiner & Quiring, 2008)	(CONN4) Users share experiences about the product or services with other users of Instagram. (CONN5) The users of Instagram do not benefit from the community visiting this social networking site (reverse coding)*.
Responsiveness (RES*i*)	(Zhao & Lu, 2012; Ridings, Gefen, & Arinze, 2002)	(RES1) When I'm using the Instagram service, other users are very responsive to my posts. (RES2) When I'm using the Instagram service, I can always count on getting a lot of responses to my posts. (RES3) When I'm using the Instagram service, I can't always count on getting responses to my posts fairly quickly (reverse coding)*.
	(Wu, 1999; Leiner & Quiring, 2008)	(RES4) I could communicate with Instagram directly for further questions about the application or its products if I wanted to. (RES5) Instagram had the ability to respond to my specific questions quickly and efficiently. (RES6) I could communicate in real time with other users who shared my interest in Instagram.
Perceived interactivity		
Two-way communication (TWC*i*)	(Groth, 2005; Yuping Liu, 2003; Song & Zinkhan, 2008; Terlutter, Diehl, & Okazaki, 2010)	(TWC1) Instagram enables conversation. (TWC2) Instagram facilitates two-way communication between the visitors and the site. (TWC3) It is not difficult to offer feedback to Instagram. (TWC4) Instagram makes me feel it wants to listen to its visitors.
	(Liu, 2003)	(TWC5) Instagram does not at all encourage visitors to talk back (reverse coding)*. (TWC6) Instagram gives visitors the opportunity to talk back.
Control-ease of use (CON*i*)	(Groth 2005; Zhao & Lu, 2012; Davis, 1989)	(CON1) Learning to use the Instagram service is easy for me. (CON2) I find it easy to get the Instagram service to do what I want it to do. (CON3) The process of using the Instagram service is clear

Constructs	Original scales´ sources	Adapted questionnaire scales
		and understandable.
Active Control (ACN*i*)	(Song & Zinkhan, 2008; Liu, 2003; McMillan & Hwang, 2002; Wu, 1999)	(ACN1) I felt that I had a lot of control over my visiting experiences at Instagram. (ACN2) While I was on Instagram, I could choose freely what I wanted to see. (ACN3) While surfing Instagram, I had absolutely no control over what I can do on the site (reversed coding)*. (ACN4) While surfing Instagram, my actions decided the kind of experiences I had.
Perceived behavioural control (PBC*i*)	(Leiner & Quiring, 2008)	(PBC1) I was in control over the information display format condition when using Instagram. (PBC2) I was in control over the content I wanted to see on Instagram.
	(Wu, 2006)	(PBC3) I was in control of my navigation through Instagram. (PBC4) I was not in total control over the pace of my visit to Instagram (reverse coding)*. (PBC5) I could communicate with Instagram directly for further questions about the company or its products if I wanted to.
Synchronicity (SIN*i*)	(Liu, 2003)	(SIN1) Instagram processed my input very quickly. (SIN2) Information can be obtained very quickly from Instagram. (SIN3) I was able to obtain the information I want without any delay. (SIN4) When I clicked on the links, I felt I was getting instantaneous information. (SIN5) Instagram was very slow in responding to my requests (reversed coding)*.
Customer participation behaviour		
Information seeking (ISE*i*)	(Ercsey, 2016; Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Yi & Gong, 2013)	(ISE1) I have asked others for information on what Instagram offers. (ISE2) I have searched for information on where Instagram is located. (ISE3) I have paid attention to how others behave in order to use Instagram well.
Information sharing (ISH*i*)	(Ercsey, 2016; Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Yi & Gong, 2013)	(ISH1) I clearly explained what I wanted the followers to do. (ISH2) I gave the followers proper information. (ISH3) I provided necessary information so that the follower could perform his or her duties. (ISH4) I answered all the followers' service-related questions.
Responsible behaviour (RB*i*)	(Ercsey, 2016; Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Yi & Gong, 2013)	(RB1) I performed all the tasks that are required. (RB2) I adequately completed all the expected behaviours. (RB3) I fulfilled responsibilities to Instagram. (RB4) I followed the followers' directives or orders.
Personal	(Ercsey, 2016; Revilla-	(PI1) I was friendly to the followers.

Constructs	Original scales´ sources	Adapted questionnaire scales
intention (PI*i*)	Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Yi & Gong, 2013)	(PI2) I was kind to the followers. (PI3) I was polite to the followers. (PI4) I was courteous to the followers. (PI5) I act rudely with the followers (reverse coding)*.

* Reverse scales items.

Note: respondents were asked to indicate their degree of agreement or disagreement with each of the items listed here, using a 7-point scale that varied from *'strongly disagree'* to *'strongly agree'*, with a midpoint *'neither agree nor disagree'*.

To measure the reliability and validity of measurement scales, we carry out a hierarchical CFA with maximum likelihood estimation, which increases the probability of inferring with a set of parameters. In addition, we propose several tests of reliability and validity, using SPSS Amos version 25, to obtain (1) internal consistency; and (2) discriminant validity.

4.5. Measurement model

We performed a SEM analysis (Hair, Black, Babin, & Anderson, 2010) with the SPSS Amos version 25 analytical software. This allowed us to validate the measurement model, test the structural model and the hypotheses on the relationships between the latent variables, and derive a new understanding from the data collected.

With SEM, we can calculate the user's behaviour and intention more accurately than standard multivariate statistics (Jöreskog, 1969). We configured the measurement model to work with complex latent variables that cannot be measured directly (Hair, Black, Babin, & Anderson, 2010), such as network interactivity, perceived interactivity, customer citizenship behaviour, and customer participation behaviour.

SEM is the most suitable method to estimate multiple statistical relationships between the latent variables of customer citizenship behaviour, network interactivity and perceived interactivity, and customer participation behaviour – which cannot be measured directly, but via the analysis of items or indicators. Additionally, SEM requires evaluating the reliability and validity of the constructs used in our research according to the data in the online survey.

We used a reflective measurement model in which the relationship goes from the construct[55] to its measured variables (items or indicators). Reflective measured variables (items or indicators) are *'error-prone manifestations of an underlying construct'* and function *'as a representative sample of all possible items available in the conceptual domain of the construct'* (Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016:4000). Since items reflect the same construct, indicators are highly correlated with each other.

This measurement perspective is complemented with the structural perspective of covariance-based structural equation modelling (CB-SEM): *'the common factor model estimation approach conforms to the measurement philosophy underlying reflective measurement models'* (Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016: 4002). Therefore, covariance-based structural equation

[55] We considered that the operationalisation of constructs in a reflective measurement model function as proxies for conceptual variables.

modelling (CB-SEM) is more appropriate than variance-based structural equation modelling (VB-SEM) to analyse the data (Hair, Gabriel, & Patel, 2014b).

CB-SEM follows a common factor model approach in the calculation of construct measures. Thus, it considers only the covariances (common variance) of a common set of indicators and no more than this variance is included in any given solution[56]. Further, CB-SEM assumes that the variance of a set of indicators is explained by the existence of one unobserved or latent variable: the common factor that functions as a proxy for a conceptual variable and individual random error.

If the construct has sufficient reliability, then single items can be discarded without changing the meaning of the construct (Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016). Therefore, we first paid attention to the multivariate normality of the data, since this is one of the requirements to use SEM.

4.5.1. Assessment of univariate and multivariate normality

The initial assumption is that the observed variables are independent and identically distributed, and jointly define a multivariate normal distribution. The results of the assessment of univariate and multivariate normality are shown in Table 7.

We performed tests to verify the approximate normality of the sample using the CFA marker technique (Bollen, 1989). Although data is not multivariate normally distributed, there is no excessive kurtosis (compared with the normal distribution) of the variables (Bollen, 1989); therefore, a covariance-based structural equation modelling (CB-SEM) is shown to be again more appropriate than variance-based structural equation modelling (VB-SEM) to analyse the data.

Table 7. Assessment of univariate and multivariate normality

Variable	Minimum	Maximum	Skewness	c.r. for Skewness*	Kurtosis	c.r. for Kurtosis**
UFE1	1	7	-0.159	-1.324	-0.932	-3.875
UFE2	1	7	-0.444	-3.691	-1.043	-4.336
UFE3	1	7	-0.529	-4.399	-1.061	-4.413
SFE1	1	7	-0.399	-3.315	-1.033	-4.294
SFE2	1	7	-0.435	-3.618	-1.006	-4.185
SFE3	1	7	-0.336	-2.798	-1.042	-4.334
SFE4	1	7	-0.234	-1.943	-0.964	-4.007
DE1	1	7	-1.023	-8.511	0.026	0.110

[56] CB-SEM separates the variance of each item in two components: first, is the common variance extracted from the variance shared with other items of a given construct in the measurement model; and second, is the individual variance that is compound of *specific* and *error* variance: *'the specific variance is assumed to be systematic and reliable while the error variance is assumed to be random and unreliable (i.e., measurement, sampling, and specification error)'* (Sestet, Hair, Ringle, Thiele, & Gudergan, 2016: 4002).

Variable	Minimum	Maximum	Skewness	c.r. for Skewness*	Kurtosis	c.r. for Kurtosis**
DE2	1	7	-1.129	-9.388	0.173	0.721
DE3	1	7	-0.896	-7.451	-0.291	-1.209
HE1	1	7	-1.399	-11.632	1.114	4.634
HE2	1	7	-1.284	-10.675	0.892	3.708
HE3	1	7	-1.174	-9.761	0.505	2.101
HE4	1	7	-0.888	-7.385	-0.134	-0.556
TO1	1	7	0.242	2.013	-0.777	-3.230
TO2	1	7	-0.103	-0.854	-1.088	-4.524
TO3	1	7	0.186	1.546	-1.280	-5.324
RE1	1	7	-0.739	-6.145	-0.375	-1.560
RE2	1	7	-0.753	-6.264	-0.422	-1.754
RE3	1	7	-1.009	-8.394	0.085	0.352
RE4	1	7	-0.786	-6.537	-0.411	-1.708
PP1	1	7	-1.156	-9.614	0.627	2.606
PP2	1	7	-0.347	-2.883	-0.586	-2.436
PP3	1	7	0.076	0.634	-0.263	-1.095
PP4	1	7	-0.267	-2.217	-0.485	-2.015
PP5	1	7	0.251	2.085	-0.759	-3.156
PL1	1	7	-1.537	-12.779	1.906	7.927
PL2	1	7	-1.776	-14.771	2.916	12.126
PL3	1	7	-0.605	-5.031	-0.379	-1.574
PL4	1	7	-1.430	-11.890	1.622	6.746
CONN1	1	7	-1.152	-9.585	0.759	3.158
CONN2	1	7	-0.897	-7.462	0.154	0.638
CONN3	1	7	-1.022	-8.502	0.458	1.903
CONN4	1	7	-0.886	-7.371	0.313	1.301
CONN5	1	7	0.366	3.048	-0.803	-3.339
RES1	1	7	-0.568	-4.726	-0.371	-1.544

Variable	Minimum	Maximum	Skewness	c.r. for Skewness*	Kurtosis	c.r. for Kurtosis**
RES2	1	7	-0.251	-2.089	-0.475	-1.977
RES3	1	7	-0.098	-0.811	-0.496	-2.064
RES4	1	7	-0.021	-0.172	-0.553	-2.298
RES5	1	7	0.021	0.178	-0.109	-0.454
RES6	1	7	-1.001	-8.323	0.365	1.519
TWC1	1	7	-1.561	-12.983	1.630	6.780
TWC2	1	7	-0.521	-4.333	-0.622	-2.586
TWC3	1	7	-0.827	-6.875	-0.304	-1.265
TWC4	1	7	-0.166	-1.377	-0.644	-2.679
TWC5	1	7	0.071	0.589	-0.587	-2.440
TWC6	1	7	-0.616	-5.125	-0.375	-1.558
CON1	1	7	-1.708	-14.201	2.693	11.199
CON2	1	7	-0.502	-4.178	-0.627	-2.607
CON3	1	7	-1.122	-9.330	0.554	2.303
ACN1	1	7	-0.421	-3.497	-0.367	-1.528
ACN2	1	7	-0.668	-5.558	-0.753	-3.133
ACN3	1	7	0.447	3.721	-0.856	-3.560
ACN4	1	7	-0.327	-2.717	-0.575	-2.390
PBC1	1	7	-0.291	-2.416	-0.707	-2.938
PBC2	1	7	-0,268	-2,227	-1.116	-4.643
PBC3	1	7	-0.588	-4.889	-0.636	-2.645
PBC4	1	7	-0.070	-0.582	-1.250	-5.196
PBC5	1	7	0.089	0.741	-0.526	-2.189
SIN1	1	7	-0.850	-7.070	0.047	0.197
SIN2	1	7	-0.549	-4.568	-0.298	-1.241
SIN3	1	7	-0.267	-2.218	-0.319	-1.326
SIN4	1	7	-0.523	-4.347	-0.237	-0.987
SIN5	1	7	0.162	1.344	-0.218	-0.908

Variable	Minimum	Maximum	Skewness	c.r. for Skewness*	Kurtosis	c.r. for Kurtosis**
ISE1	1	7	-0.271	-2.256	-1.210	-5.032
ISE2	1	7	-0.060	-0.502	-1.327	-5.516
ISE3	1	7	-0.923	-7.680	-0.067	-0.279
ISH1	1	7	-0.141	-1.175	-0.715	-2.973
ISH2	1	7	-0.779	-6.483	-0.249	-1.036
ISH3	1	7	-0.673	-5.595	-0.326	-1.357
ISH4	1	7	-0.687	-5.714	-0.372	-1.546
RB1	1	6	-1.054	-8.764	0.812	3.376
RB2	1	6	-1.980	-16.468	4.066	16.910
RB3	1	6	-2.094	-17.415	4.507	18.743
RB4	1	6	-1.152	-9.579	1.270	5.280
PI1	1	7	-2.686	-22.338	7.743	32.197
PI2	1	7	-3.114	-25.897	11.101	46.163
PI3	1	7	-3.925	-32.645	18.248	75.881
PI4	1	7	-2.935	-24.406	9.071	37.721
PI5	1	7	2.841	23.631	7.087	29.472
Multivariate					963.638	85.692

*The critical ratio in the c.r. for the skewness column is the sample skewness divided by its standard error.
**The critical ratio in the c.r. for the kurtosis column is the sample kurtosis divided by its standard error.

Shown in Table 7 is the output associated with the hierarchical CFA validation (Byrne, 2010), which is the univariate statistics for skewness and kurtosis. In addition, table 7 quantifies departure from normality in the sample and estimates whether departure from normality is statistically significant.

The critical ratios for skewness and kurtosis (*c.r.*) prove their statistical significance, which is formed by taking the ratio of the estimate to their respective standard error. The critical ratio is distributed as a unit of the normal variate, or z-score (Byrne, 2010:336). By adopting a conventional alpha of 0.05, then a c.r. < -1.96 or > 1.96 for any given test might be an indication of departure from normality.

As Kline (2011) pointed out, it can be easy to reject the null hypotheses (of consistency with the normal distribution) when using large-sample procedures, as in SEM. We used the Bollen-Stine bootstrap to test the null hypotheses that the model is correct (the model fit better in 5000 bootstraps resamples and worse in 0 bootstraps resamples); we reject the null hypotheses with $p = 0.002$.

We also adopted a more descriptive approach to assess normality. For example, Byrne (2010) suggested a kurtosis value of > 7.00 to indicate a more substantial departure from normality. However, Kline (2011) argued that kurtosis values ranging from 8.00 to 20.00 could be taken as indicative of more extreme levels of kurtosis. He also stated that skewness values greater than 3.00 (in absolute value) could indicate more extreme skew levels.

Kurtosis is more relevant than skewness in the context of SEM because it impacts tests of variance and covariance, whereas skewness has a greater impact on means. Hence, we should pay greater attention to the issue of kurtosis (rather than to skewness) when assessing whether data substantially departs from normality. In our data, all variables appear to exhibit significant skewness and kurtosis (Byrne, 2010).

Multivariate kurtosis (provided at the end of Table 7) is used to assess whether the data substantially departs from multivariate normality. The c.r. and the previous rules of thumb can be applied to address whether the data significantly depart from multivariate normality. Nevertheless, multivariate kurtosis values > 5.00 can be treated as indicative of departure from multivariate normality (Byrne, 2010). Both methods make it clear that the variables in this analysis reflect a significant departure from multivariate normality, although some items with low factor loading will be later eliminated during the analysis; therefore, we look at the presence of multivariate outliers (see Table 8).

Table 8. Assessment of the presence of multivariate outliers*

Observation number	Mahalanobis *d*-squared	p1**	p2***
98	221.553	0.000	0.000
288	202.550	0.000	0.000
79	202.512	0.000	0.000
351	179.622	0.000	0.000
159	173.667	0.000	0.000
172	165.444	0.000	0.000
357	164.069	0.000	0.000
179	157.637	0.000	0.000
176	155.245	0.000	0.000
164	154.753	0.000	0.000
320	154.269	0.000	0.000
124	153.061	0.000	0.000
43	150.991	0.000	0.000
329	149.598	0.000	0.000
401	148.268	0.000	0.000

Observation number	Mahalanobis *d*-squared	p1**	p2***
299	143.743	0.000	0.000
270	140.690	0.000	0.000
251	138.610	0.000	0.000
189	138.322	0.000	0.000
23	138.081	0.000	0.000
102	136.429	0.000	0.000
199	136.117	0.000	0.000
170	135.705	0.000	0.000
321	135.585	0.000	0.000
106	135.527	0.000	0.000
127	134.773	0.000	0.000
119	134.670	0.000	0.000
130	134.300	0.000	0.000
52	132.634	0.000	0.000
207	132.287	0.000	0.000
333	131.788	0.000	0.000
160	131.548	0.000	0.000
208	130.661	0.000	0.000
157	129.807	0.000	0.000
415	129.803	0.000	0.000
153	128.435	0.000	0.000
26	127.777	0.001	0.000
252	127.373	0.001	0.000
317	127.352	0.001	0.000
223	127.269	0.001	0.000
178	126.855	0.001	0.000
341	125.663	0.001	0.000
132	125.251	0.001	0.000

Observation number	Mahalanobis *d*-squared	p1**	p2***
65	125.092	0.001	0.000
312	124.082	0.001	0.000
129	123.887	0.001	0.000
283	123.041	0.001	0.000
295	121.735	0.002	0.000
57	121.009	0.002	0.000
49	120.826	0.002	0.000
198	120.334	0.002	0.000
331	120.304	0.002	0.000
370	120.120	0.002	0.000
397	119.392	0.003	0.000
125	119.148	0.003	0.000
123	119.048	0.003	0.000
165	118.989	0.003	0.000
59	118.610	0.003	0.000
111	117.724	0.004	0.000
282	117.596	0.004	0.000
182	117.329	0.004	0.000
342	116.412	0.005	0.000
285	116.162	0.005	0.000
409	115.506	0.006	0.000
10	115.181	0.006	0.000
383	115.170	0.006	0.000
411	114.308	0.007	0.000
359	113.836	0.008	0.000
181	113.285	0.009	0.000
72	113.027	0.009	0.000
183	112.591	0.010	0.000

Observation number	Mahalanobis *d*-squared	p1**	p2***
187	112.506	0.010	0.000
45	112.386	0.010	0.000
389	110.476	0.014	0.000
12	110.358	0.014	0.000
284	109.519	0.016	0.000
200	109.132	0.017	0.000
267	108.142	0.020	0.000
297	108.102	0.020	0.000
38	107.761	0.021	0.000
40	107.540	0.022	0.000
86	107.168	0.023	0.000
279	106.812	0.024	0.000
58	106.556	0.025	0.000
185	106.484	0.026	0.000
313	106.479	0.026	0.000
97	106.356	0.026	0.000
363	105.775	0.028	0.000
395	105.297	0.031	0.000
210	105.220	0.031	0.000
56	105.119	0.031	0.000
347	104.883	0.033	0.000
247	104.203	0.036	0.000
114	103.981	0.037	0.000
88	103.631	0.039	0.000
394	103.155	0.042	0.000
222	102.991	0.043	0.000
68	102.748	0.044	0.000
154	102.468	0.046	0.000

Observation number	Mahalanobis *d*-squared	p1**	p2***
277	102.428	0.046	0.000

* Observations farthest from the centroid (mahalanobis distance).
**The p1 column exhibit the probability of exceeding the mahalanobis *d*-squared value.
***The p2 column exhibit the probability of any second exceeding the mahalanobis *d*-squared value.

Although SPSS Amos version 25 does not provide information on univariate outliers, it does allow us to assess the presence of multivariate outliers in our data. For each case, a square mahalanobis distance value is generated, along with test statistics that can be used to determine that a case represents a multivariate outlier.

Mahalanobis distance measures the distance of a given observation from the centroid (i.e., multivariate mean) for the variables included in our analysis. Cases with big mahalanobis *d*-squared values are more likely to be multivariate outliers. Mahalanobis *d*-squared is: *'distributed as a central chi-square statistic with degrees of freedom equal to the number of variables'* (Kline, 2011:54). When testing the statistical significance, we take a more conservative p-value, such as $p < 0.001$ (Kline, 2011).

A multivariate outlier will tend to have a mahalanobis *d*-squared value that is substantially different from the others in the dataset. For example, the p2 column contains ordered values of N, which *p*-values test the probability of being further from the centroid (Byrne, 2010). Byrne (2010:341) stated that: *'although small numbers appearing in the first column (p1) are to be expected, small numbers in the second column (p2) are improbably far from the centroid under the hypotheses of normality'* (Byrne, 2010:341). Therefore, our data exhibits non-normality.

4.5.2. Measurement model and hierarchical CFA

Two models are considered in covariance-based SEM analysis: the measurement model and the structural model.

First, the measurement model is assessed, in which the latent variables are constructed from their associated observed variables. This can be done when a priori factor structure is proposed, since we have a priori information (theoretical background). SEM requires an a priori model based on theory. Additional risks such as poor planning, unreliable data and theoretical misinterpretation can lead to wrong conclusions[57].

We use CFA to validate our measurement model (Bagozzi & Yi, 2012). The fitness of a second order measurement model is generally assessed by hierarchical CFA. A measurement model is considered adequate if the structure of the covariance of the model is similar to the structure of the covariance of the data, and this adequacy is shown in the goodness-of-fit index or GFI (Cheung & Rensvold, 2002).

[57] Beran & Violato (2010) argued that SEM has its limits in the correct definition of a construct because the link between construct-latent variables is stronger than the link between construct-measured variables since the latter includes an error; they also argued that an incorrect a priori specification can lead to poor research design, inconclusive data, a theoretical overinterpretation of causal relationships and incorrect conclusions.

In addition, a hierarchical CFA is a confirmatory technique that is guided by theory. Therefore, the analysis is derived from the theoretical relationship between the observed and the unobserved variables.

With the data collected, we will confirm which items are valid to measure the associated constructs and which ones should be eliminated:

1. The first step of the measurement model analysis is to check, through a hierarchical factor analysis of the items, if they define each latent construct. With factor analysis, we can verify if the items are loaded in the associated latent variable.

2. The second step of the data analysis is the construct validity analysis and includes an assessment of the internal reliability, the convergent validity and the discriminant validity of the constructs.

The internal reliability of the constructs uses the Cronbach's *α* correlations and the item-to-total correlations. For the individual hierarchical CFA, the Cronbach's *α* and item-to-total correlations are calculated. In all constructs, all Cronbach's α values should be > 0.70 (Cronbach, 1947), and all item-to-total correlation must be > 0.40 (Loiacono, Watson, & Goodhue, 2002).

The construct validity analysis (Bagozzi & Yi, 2012) continues through CFA, which consists of two different validity analyses: convergent and discriminant. The convergent validity of the constructs considers the factor loading of each dimension in each construct:

- We perform a hierarchical CFA of all the model constructs: factor loadings should exceed the minimum recommended value of 0.70 (Hair *et al*., 2010). If the factor loading is 0.70, the observed variable explains the latent variable variance of (0.70^2 = 0,49) 49%. Factor loadings < 0.70 are non-significant, indicating that more than 49% of the variance of an item is explicated by factors different from those corresponding to the construct.

- We extract the composite reliability (CR*)* coefficient of each construct taken from its respective dimensions: CR must be greater than the recommended value of 0.70 (Hair, Babin, & Anderson, 2010).

- The average variance extracted (AVE) of each construct is taken from its respective dimensions: the AVE values should be higher than the recommended lower limit of 0.50 (Hair *et al.*, 2010).

With respect to convergent validity, the condition that must be met in all cases is that CR values should be higher than the AVE's (Hair *et al.*, 2010).

We evaluated the discriminant validity of the constructs to understand if factors are different from each other. We do so by comparing the square root of the AVE coefficient with the correlation between the second order constructs (Fornell & Larcker, 1981) and by an HTMT analysis (Henseler, Ringle, & Sarstedt, 2015) on first order constructs.

Each step of the quantitative methodology is closely examined in the following sections of the hierarchical CFA and the construct validity analysis.

4.5.3. Hierarchical CFA

The first step of a hierarchical CFA (Chong, Nazim, & Ahmad, 2014) is to evaluate the factor loading in each item (Schreiber *et al.*, 2006). The factor loading is the degree to which an item helps determine its corresponding construct. The significance of each factor loading must be above the cut-off value of 0.70 (Hair, Black, Babin, & Anderson, 2010). Therefore, it is essential to verify if the factor loading of an item is significant enough to support its related and predicted construct. The result of CFA is seen in Table 9.

Table 9. The CFA of the measurement model for the main constructs and subconstructs

	Construct		Item	Factor loading	CR	AVE
Second order factors (main constructs)						
	CCB	→	UFE*i*	0.607	0.820	0.477
		→	SFE*i*	0.580		
		→	DE*i*	0.947		
		→	HE*i*	0.707		
		→	TO*i*	0.073		
		→	RE*i*	0.870		
	NI	→	PP*i*	0.880	0.894	0.680
		→	PL*i*	0.832		
		→	CONN*i*	0.753		
		→	RES*i*	0.828		
	PI	→	TWC*i*	0.757	0.867	0.568
		→	CON*i*	0.728		
		→	ACN*i*	0.869		
		→	PBC*i*	0.689		
		→	SIN*i*	0.711		
	CPB	→	ISE*i*	0.598	0.775	0.464
		→	ISH*i*	0.744		
		→	RB*i*	0.743		
		→	PI*i*	0.628		

	Construct		Item	Factor loading	CR	AVE
First order factors (subconstructs)						
CCB	UFE*i*	→	UFE1	0.807	0.785	0.551
		→	UFE2	0.770		
		→	UFE3	0.639		
	SFE*i*	→	SFE1	0.751	0.871	0.629
		→	SFE2	0.832		
		→	SFE3	0.825		
		→	SFE4	0.761		
	DE*i*	→	DE1	0.729	0.866	0.685
		→	DE2	0.882		
		→	DE3	0.864		
	HE*i*	→	HE1	0.889	0.904	0.702
		→	HE2	0.914		
		→	HE3	0.802		
		→	HE4	0.735		
	TO*i*	→	TO1	0.612	0.740	0.493
		→	TO2	0.854		
		→	TO3	0.613		
	RE*i*	→	RE1	0.889	0 910	0.719
		→	RE2	0.876		
		→	RE3	0.925		
		→	RE4	0.681		
NI	PPi	→	PP1	0.699	0.576	0.283
		→	PP2	0.619		
		→	PP3	0.132		
		→	PP4	0.559		
		→	PP5	0.463		

	Construct		Item	Factor loading	CR	AVE
	PL*i*	→	PL1	0.808	0.874	0.635
		→	PL2	0.857		
		→	PL3	0.691		
		→	PL4	0.822		
	CONN*i*	→	CONN1	0.758	0.765	0.465
		→	CONN2	0.739		
		→	CONN3	0.795		
		→	CONN4	0.750		
		→	CONN5	0.094		
	RES*i*	→	RES1	0.728	0.621	0.262
		→	RES2	0.649		
		→	RES3	0.001		
		→	RES4	0.368		
		→	RES5	0.336		
		→	RES6	0.612		
PI	TWC*i*	→	TWC1	0.643	0.743	0.377
		→	TWC2	0.742		
		→	TWC3	0.502		
		→	TWC4	0.695		
		→	TWC5	0.045		
		→	TWC6	0.749		
	CON*i*	→	CON1	0.769	0.793	0.565
		→	CON2	0.615		
		→	CON3	0.851		
	ACN*i*	→	ACN1	0.700	0.473	0.310
		→	ACN2	0.673		
		→	ACN3	0.273		
		→	ACN4	0.473		

	Construct		Item	Factor loading	CR	AVE
	PBC*i*	→	PBC1	0.734	0.698	0.399
		→	PBC2	0.835		
		→	PBC3	0.803		
		→	PBC4	0.071		
		→	PBC5	0.333		
	SIN*i*	→	SIN1	0.674	0.740	0.481
		→	SIN2	0.824		
		→	SIN3	0.786		
		→	SIN4	0.745		
		→	SIN5	0.313		
CPB	ISE*i*	→	ISE1	0.740	0.756	0.508
		→	ISE2	0.715		
		→	ISE3	0.682		
	ISH*i*	→	ISH1	0.640	0.854	0.598
		→	ISH2	0.829		
		→	ISH3	0.879		
		→	ISH4	0.722		
	RB*i*	→	RB1	0.593	0.816	0.534
		→	RB2	0.839		
		→	RB3	0.849		
		→	RB4	0.599		
	PI*i*	→	PI1	0.814	0.802	0.579
		→	PI2	0.948		
		→	PI3	0.882		
		→	PI4	0.646		
		→	PI5	0.375		

Note: CFA measurements: RMSEA=0.052; CFI=0.807; TLI=0.801; ChiSq/df=2.127.

A principal component analysis (PCA) was also performed in the 80 items with orthogonal rotation (varimax). The Kaiser–Meyer–Olkin measure confirmed the adequacy of the sampling for the analysis (KMO = 0.912), and all KMO values for individual items were above the acceptable limit of 0.50 (Field, 2009:671). Bartlett's test of sphericity (χ^2 (3160) = 19,624.460, $p < 0.000$) indicated that correlations between items were sufficiently large for PCA. An initial analysis was performed to calculate the eigenvalue of each component in the data. Nineteen components had eigenvalues above Kaiser's criterion of 1, that combined explained 68.272% of the variance. Given the large sample size (N = 415) and the convergence of the scree plot and Kaiser's criterion on 19 components, we retained 19 components in the final analysis.

In Table 9, fifty items have a significant factor loading > 0.70 that support their corresponding construct. Thirty items have a non-significant factor loading < 0.70. We maintained the items TO3, RES2, PP2 and ACN2, which standardised factor loadings are > 0.60 and < 0.70 since they are one of 2-item in a factor (Chin, Gopal, & Salisbury, 1997; Hair *et al.*, 2010b)[58]. Also, we kept CON2 and SIN1, for discriminant validity purposes. Hence, we finally removed the following items:

- UFE3 (0.639) of unsolicited feedback.
- TO1 (0.612) of tolerance.
- RE4 (0.681) of recommendation.
- PP3 (0.132), PP4 (0.559) and PP5 (0.463) of perceived personalisation.
- PL3 (0.691) of playfulness.
- CONN5 (0.094) of connectedness.
- RES3 (0.001), RES4 (0.368) RES5 (0.336) and RES6 (0.612) of responsiveness.
- TWC1 (0.643) and TWC3 (0.502) and TWC5 (0.045) of two-way communication.
- ACN3 (0.273) and ACN4 (0.473) of active control.
- PBC4 (0.071) and PBC5 (0.333) of perceived behavioural control.
- SIN5 (0.313) of synchronicity.
- ISE3 (0.682) of information seeking.
- ISH1 (0.640) of information sharing.
- RB1 (0.593) and RB4 (0.599) of responsible behaviour.
- PI4 (0.646) and PI5 (0.375) of personal intention.

[58] Many studies reported that factor loadings > 0.50 (Hulland, 1999; Truong & McColl, 2011), while in the context of tourism, Chen & Tsai (2007) also considered 0.50 as the threshold. Even more, Ertz, Karakas, & Sarigöllü (2016) considered factor loadings of 0.40 for their CFA when exploring pro-environmental consumer behaviour.

Therefore, twenty-six items with low factor loadings were questioned and eliminated, as shown in Table 10.

Table 10. The CFA of the measurement model for the main constructs and subconstructs without low factor loading items

	Construct		Item	Factor loading	CR	AVE
Second order factors (main constructs)						
	CCB	→	UFE*i*	0.593	0.818	0.472
		→	SFE*i*	0.568		
		→	DE*i*	0.956		
		→	HE*i*	0.700		
		→	TO*i*	0.095		
		→	RE*i*	0.862		
	NI	→	PP*i*	0.777	0.845	0.577
		→	PL*i*	0.821		
		→	CONN*i*	0.747		
		→	RES*i*	0.688		
	PI	→	TWC*i*	0.728	0.863	0.559
		→	CON*i*	0.724		
		→	ACN*i*	0.879		
		→	PBC*i*	0.685		
		→	SIN*i*	0.707		
	CPB	→	ISE*i*	0.490	0.751	0.401
		→	ISH*i*	0.710		
		→	RB*i*	0.673		
		→	PI*i*	0.638		
First order factors (subcontracts)						
CCB	UFE*i*	→	UFE1	0.750	0.772	0.629
		→	UFE2	0.834		

	Construct		Item	Factor loading	CR	AVE
	SFE*i*	→	SFE1	0.751	0.871	0.629
		→	SFE2	0.831		
		→	SFE3	0.826		
		→	SFE4	0.761		
	DE*i*	→	DE1	0.727	0.866	0.684
		→	DE2	0.878		
		→	DE3	0.867		
	HE*i*	→	HE1	0.889	0.903	0.702
		→	HE2	0.915		
		→	HE3	0.801		
		→	HE4	0.734		
	TO*i*	→	TO2	0.675	0.689	0.527
		→	TO3	0.773		
	RE*i*	→	RE1	0.881	0 927	0.809
		→	RE2	0.885		
		→	RE3	0.931		
NI	PPi	→	PP1	0.834	0.697	0.540
		→	PP2	0.620		
	PL*i*	→	PL1	0.814	0.873	0.697
		→	PL2	0.878		
		→	PL4	0.810		
	CONN*i*	→	CONN1	0.756	0.846	0.578
		→	CONN2	0.738		
		→	CONN3	0.797		
		→	CONN4	0.750		
	RES*i*	→	RES1	0.827	0.750	0.601
		→	RES2	0.720		
PI	TWC*i*	→	TWC2	0.721	0.777	0.537

	Construct		Item	Factor loading	CR	AVE
		→	TWC4	0.734		
		→	TWC6	0.743		
	CON*i*	→	CON1	0.768	0.793	0.565
		→	CON2	0.617		
		→	CON3	0.852		
	ACN*i*	→	ACN1	0.727	0.647	0.479
		→	ACN2	0.655		
	PBC*i*	→	PBC1	0.723	0.836	0.630
		→	PBC2	0.845		
		→	PBC3	0.808		
	SIN*i*	→	SIN1	0.672	0.844	0.576
		→	SIN2	0.827		
		→	SIN3	0.789		
		→	SIN4	0.740		
CPB	ISE*i*	→	ISE1	0.837	0.732	0.579
		→	ISE2	0.677		
	ISH*i*	→	ISH2	0.833	0.855	0.664
		→	ISH3	0.874		
		→	ISH4	0.730		
	RB*i*	→	RB2	0.875	0.869	0.768
		→	RB3	0.878		
	PI*i*	→	PI1	0.815	0.914	0.781
		→	PI2	0.974		
		→	PI3	0.854		

Note: CFA measurements: RMSEA=0.049; CFI=0.899; TLI=0.8903 ChiSq/df=1.995.

Table 11 shows the standardised total effects after rotation for the second order constructs. Again, the items that cluster on the same components confirmed that component.

Table 11. Standardised total effects of the second order constructs

	NI	CCB	CPB	PI
UFE*i*	0.000	**0.593**	0.000	0.000
SFE*i*	0.000	**0.568**	0.000	0.000
DE*i*	0.000	**0.956**	0.000	0.000
HE*i*	0.000	**0.700**	0.000	0.000
TO*i*	0.000	**0.095**	0.000	0.000
RE*i*	0.000	**0.862**	0.000	0.000
PP*i*	**0.777**	0.000	0.000	0.000
PL*i*	**0.821**	0.000	0.000	0.000
CONN*i*	**0.747**	0.000	0.000	0.000
RES*i*	**0.688**	0.000	0.000	0.000
TWC*i*	0.000	0.000	0.000	**0.728**
CON*i*	0.000	0.000	0.000	**0.724**
ACN*i*	0.000	0.000	0.000	**0.879**
PBC*i*	0.000	0.000	0.000	**0.685**
SIN*i*	0.000	0.000	0.000	**0.707**
ISE*i*	0.000	0.000	**0.490**	0.000
ISH*i*	0.000	0.000	**0.710**	0.000
RB*i*	0.000	0.000	**0.673**	0.000
PI*i*	0.000	0.000	**0.638**	0.000

We eliminated first order constructs with factor loading ≤ 0.60 (Tabachnick & Fidell, 2001), which implied a weak effect on its corresponding second order construct. These first order constructs were: information seeking (factor loading equals to 0.490), tolerance (0.095) and solicited feedback (0.568). We thus propose a model with first order constructs that have a factor loading over 0.60, except for UFE*i* (factor loading equals to 0.593), which is kept for theoretical purposes. Similarly, we also retain items PP2, ACN2, CON2 and SIN1, which have factor loadings > 0.60 and < 0.70 based on theoretical grounds. According to Hair *et al*. (2010), we can keep items with factor loading > 0.30 as long as the sample size is above 350.

Table 12. The CFA of the measurement model for the non-eliminated constructs and subconstructs, measured without low factor items

	Construct		Item	Factor loading	CR	AVE
Second order factors (main constructs)						
	CCB	→	UFE*i*	0.545	0.863	0.623
		→	DE*i*	0.978		
		→	HE*i*	0.670		
		→	RE*i*	0.888		
	NI	→	PP*i*	0.761	0.842	0.573
		→	PL*i*	0.836		
		→	CONN*i*	0.745		
		→	RES*i*	0.678		
	PI	→	TWC*i*	0.728	0.863	0.559
		→	CON*i*	0.727		
		→	ACN*i*	0.878		
		→	PBC*i*	0.683		
		→	SIN*i*	0.707		
	CPB	→	ISH*i*	0.727	0.735	0.481
		→	RB*i*	0.704		
		→	PI*i*	0.648		
First order factors (subcontracts)						
CCB	UFE*i*	→	UFE1	0.747	0.773	0.631
		→	UFE2	0.839		
	DE*i*	→	DE1	0.702	0.861	0.676
		→	DE2	0.863		
		→	DE3	0.889		
	HE*i*	→	HE1	0.890	0.903	0.702
		→	HE2	0.915		

	Construct		Item	Factor loading	CR	AVE
		→	HE3	0.801		
		→	HE4	0.732		
	RE*i*	→	RE1	0.880	0 927	0.809
		→	RE2	0.885		
		→	RE3	0.932		
NI	PPi	→	PP1	0.840	0.699	0.543
		→	PP2	0.616		
	PL*i*	→	PL1	0.814	0.873	0.697
		→	PL2	0.879		
		→	PL4	0.809		
	CONN*i*	→	CONN1	0.756	0.846	0.578
		→	CONN2	0.738		
		→	CONN3	0.797		
		→	CONN4	0.750		
	RES*i*	→	RES1	0.834	0.751	0.603
		→	RES2	0.714		
PI	TWC*i*	→	TWC2	0.721	0.776	0.536
		→	TWC4	0.733		
		→	TWC6	0.743		
	CON*i*	→	CON1	0.768	0.793	0.565
		→	CON2	0.617		
		→	CON3	0.852		
	ACN*i*	→	ACN1	0.728	0.648	0.480
		→	ACN2	0.655		
	PBC*i*	→	PBC1	0.723	0.836	0.630
		→	PBC2	0.845		
		→	PBC3	0.808		
	SIN*i*	→	SIN1	0.672	0.844	0.576

	Construct		Item	Factor loading	CR	AVE
		→	SIN2	0.827		
		→	SIN3	0.789		
		→	SIN4	0.740		
CPB	ISH*i*	→	ISH2	0.834	0.854	0.663
		→	ISH3	0.876		
		→	ISH4	0.725		
	RB*i*	→	RB2	0.873	0.868	0.767
		→	RB3	0.879		
	PI*i*	→	PI1	0.816	0.914	0.781
		→	PI2	0.969		
		→	PI3	0.859		

Note: CFA measurements: RMSEA=0.051; CFI=0.911; TLI=0.904; ChiSq/df=2.088.

When the AVE value is below 0.50, the variance of the latent variable is less than the measurement error. This entails that the first order factor (sub-construct) does not have sufficient communality to support a single unified latent factor. However, we can accept AVE values lower than 0.50, such as in the case of customer participation behaviour's (with an AVE equal to 0.481) and active control (0.480) provided the CR value exceeds 0.60 (see Table 12). This is because the convergent validity of these constructs is satisfactory (Fornell & Larcker, 1981).

From Table 12, we infer that defence (with a factor loading of 0.978), recommendation (0.888), helping (0.670), and unsolicited feedback (0.545) are relevant in measuring customer citizenship behaviour. Playfulness (factor loading equal to 0.836), connectedness (0.745), perceived personalisation (0.761) and responsiveness (0.678) have great importance in measuring network interactivity. Two-way communication (factor loading of 0.728), active control (0.878), control-ease of use (0.727), synchronicity (0.707) and perceived behavioural control (0.683) are relevant in measuring perceived interactivity. Finally, responsible behaviour (factor loading of 0.727), personal intention (0.704) and information sharing (0.648) have great importance in measuring customer participation behaviour.

4.5.4. Construct validity analysis

After verifying factor loadings, the internal consistency of the constructs of the self-reported items in the questionnaire[59], we evaluated the validity analysis. We carried out two different types of validity analysis: convergent and discriminant (Heinzl, Buxmann, Wendt, & Weitzel, 2011). Convergent validity evaluates the suitability or relevance of the elements that describe latent

[59] Also called reliability, it refers to the accuracy and precision of the measurement instrument.

constructs. The discriminant validity examines if the indices of latent constructs that are not hypothetically related, also turn out not to be related to the collected data.

We begin by evaluating the reliability (internal consistency) that measures the degree of the different items of a construct to produce the same results. We assessed the reliability measures the internal consistency of all the items of a given construct using Cronbach's *α* and the item-to-total correlation.

The results, shown in Table 13, indicate that both items and constructs have a high level of reliability (internal consistency), since all Cronbach's *α* rates exceed the minimum cut-off limit of 0.60 (Hair, Black, Babin, & Anderson, 2010) and are even higher than 0.70 (Esteban & Abascal, 2009). Also, the item-to-total correlations for all items were above the minimum cut-off limit of 0.40 (Loiacono *et al*., 2002). This indicates the extent to which the items of the test coincide with the objectives or specifications of the test used to explain the constructs: an item-to-total correlation of 0.40 implies that 16% of the variance of the item is shared with other items in the scale (see Table 13).

Table 13. Internal consistency analysis*

Second order factors	First order factors	Item	Cronbach `s *α*	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation
CCB	UFE*i*	UFE1	0.770	242.846	1,686.343	0.409	0.495
		UFE2		242.393	1,674.171	0.454	0.511
	DE*i*	DE1	0.860	241.602	1,666.796	0.585	0.562
		DE2		241.528	1,654.115	0.662	0.736
		DE3		241.733	1,650.564	0.675	0.786
	HE*i*	HE1	0.902	241.287	1,675.572	0.575	0.784
		HE2		241.337	1,679.968	0.554	0.795
		HE3		241.439	1,673.749	0.577	0.665
		HE4		241.696	1,673.135	0.557	0.626
	RE*i*	RE1	0.926	241.831	1,653.846	0.683	0.755
		RE2		241.901	1,654.205	0.658	0.771
		RE3		241.557	1,656.185	0.688	0.821
NI	PP*i*	PP1	0.682	241.465	1,674.100	0.594	0.549
		PP2		242.533	1,682.781	0.473	0.436
	PL*i*	PL1	0.871	241.075	1,684.103	0.619	0.624
		PL2		240.969	1,684.436	0.648	0.703

Second order factors	First order factors	Item	Cronbach `s α	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation
		PL4		241.077	1,684.738	0.640	0.634
	CONN*i*	CONN1	0.846	241.219	1,690.292	0.570	0.583
		CONN2		241.419	1,690.954	0.537	0.557
		CONN3		241.381	1,684.038	0.597	0.594
		CONN4		241.398	1,697.569	0.501	0.560
	RES*i*	RES1	0.747	241.749	1,686.652	0.540	0.527
		RES2		242.487	1,688.888	0.474	0.477
PI	TWC*i*	TWC2	0.776	242.007	1,679.684	0.509	0.472
		TWC4		242.708	1,684.806	0.469	0.490
		TWC6		241.793	1,686.025	0.504	0.511
	CON*i*	CON1	0.782	241.000	1,698.560	0.509	0.576
		CON2		242.292	1,696.627	0.378	0.481
		CON3		241.405	1,691.696	0.493	0.584
	ACN*i*	ACN1	0.645	242.200	1,691.938	0.466	0.510
		ACN2		242.055	1,681.995	0.441	0.547
	PBC*i*	PBC1	0.832	242.610	1,685.987	0.453	0.515
		PBC2		242.665	1,686.286	0.397	0.669
		PBC3		242.082	1,690.351	0.422	0.599
	SIN*i*	SIN1	0.841	241.605	1,692.800	0.472	0.495
		SIN2		242.043	1,689.356	0.475	0.621
		SIN3		242.366	1,694.469	0.456	0.594
		SIN4		241.988	1,691.036	0.486	0.552
CPB	ISH*i*	ISH2	0.849	241.716	1,681.446	0.506	0.637
		ISH3		241.923	1,675.144	0.545	0.703
		ISH4		241.882	1,677.341	0.523	0.577
	RB*i*	RB2	0.869	241.713	1,712.799	0.489	0.660
		RB3		241.680	1,712.566	0.493	0.648

Second order factors	First order factors	Item	Cronbach `s α	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation
	PI*i*	PI1	0.908	240.643	1,710.307	0.479	0.671
		PI2		240.528	1,713.032	0.523	0.822
		PI3		240.405	1,720.135	0.515	0.766

*Overall rotated Cronbach's α =0.946 and rotated standardised Cronbach's α =0.949

We continue with the measurement of the convergent validity for each construct, and to what extent its items do not have random errors that produce consistent results (Doral-Fábregas, Rodríguez-Ardura, & Meseguer-Artola, 2018). With this purpose, two parameters are measured: composite reliability (CR) and average variance extracted (AVE). For each construct the CR must be greater than the lower cut-off limit of 0.70 (Bagozzi & Yi, 2012), and the rate of AVE should be greater than 0.50 (Fornell & Larcker, 1981).

As shown in Table 12, all the CR parameters on first and second order factors are greater than 0.70, except for active control (ACN*i*); all AVE estimates on first and second order factors exceed 0.50, apart from active control (ACN*i*) and customer participation behaviour (CPB).

We maintain active control (ACN*i*) and customer participation behaviour (CPB) for theoretical purposes. This is done to study the link between perceived behavioural control (actor's internal disposition) and active control (actor's intentionality) of the interaction amongst customers and how to make explicit the conditions that affect both the interaction and its consequences. Since both conditions – active control (ACN*i*) and customer participation behaviour (CPB) – are essential during transformational mechanisms, we differentiate them from an analytical point of view by applying the perspectives, explanations and choices presented in the theory of planned behaviour (Ajzen, 2020).

Finally, we evaluate the discriminant validity to verify if the parameters of the latent constructs (which are not theoretically related) are, in fact not related to the real construct in the data. With regards to discriminant validity at the level of the second order construct, Table 14 shows the AVE-SE comparisons with diagonal values (which are the square root of AVE) and the remaining values that are the correlation between the constructs (Fornell & Larcker, 1981). The discriminant validity is obtained when the diagonal values are higher when we compare with the adjacent value in their respective rows and columns. The analysis indicates that all fit well.

Table 14. Discriminant validity index summary for second order constructs*

Construct	CCB	CPB	PI	NI
CCB	**0.789**			
CPB	0.677	**0.693**		
PI	0.491	0.548	**0.747**	
NI	0.821	0.832	0.745	**0.764**

*Fornell-Larker (1981) compares the square root of AVE in the diagonal with the inter-construct correlations. We correlate the residual error term of ACN2 and ACN3 due to a large number of first order control constructs in PI (Koufteros, Babbar, & Kaighobadi, 2009).

We calculate in Table 15 the implied correlations of the forty-six items to show discriminant validity of the first order construct level, where the weight of an item in a construct must be higher than its weight in other constructs.

Table 15. Implied correlations for the discriminant validity of first order constructs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
UFE1	0.194	0.200	0.179	0.144	0.139	0.179	0.148	0.148	0.228	0.251	0.281	0.256	0.361	0.273	0.398	**0.747**
UFE2	0.218	0.225	0.201	0.162	0.156	0.201	0.166	0.166	0.256	0.282	0.316	0.287	0.406	0.306	0.447	**0.839**
DE1	0.327	0.338	0.301	0.243	0.235	0.302	0.250	0.250	0.385	0.423	0.475	0.432	0.610	0.460	**0.702**	0.375
DE2	0.402	0.415	0.370	0.298	0.288	0.371	0.307	0.307	0.473	0.520	0.583	0.530	0.749	0.565	**0.863**	0.460
DE3	0.415	0.428	0.381	0.308	0.297	0.382	0.316	0.317	0.488	0.536	0.601	0.547	0.772	0.582	**0.889**	0.474
HE1	0.284	0.293	0.261	0.211	0.203	0.262	0.217	0.217	0.334	0.367	0.412	0.374	0.529	**0.890**	0.583	0.325
HE2	0.292	0.302	0.269	0.217	0.209	0.269	0.223	0.223	0.344	0.378	0.423	0.385	0.544	**0.915**	0.599	0.334
HE3	0.256	0.264	0.235	0.190	0.183	0.236	0.195	0.195	0.301	0.330	0.371	0.337	0.476	**0.801**	0.525	0.293
HE4	0.234	0.241	0.215	0.173	0.168	0.215	0.178	0.179	0.275	0.302	0.339	0.308	0.435	**0.732**	0.480	0.268
RE1	0.372	0.384	0.342	0.276	0.267	0.343	0.284	0.284	0.438	0.481	0.540	0.491	**0.880**	0.523	0.764	0.426
RE2	0.375	0.387	0.345	0.278	0.268	0.345	0.286	0.286	0.441	0.484	0.543	0.494	**0.885**	0.526	0.768	0.429
RE3	0.394	0.407	0.363	0.292	0.282	0.363	0.301	0.301	0.464	0.509	0.571	0.520	**0.932**	0.554	0.809	0.451
PP1	0.369	0.381	0.340	0.341	0.329	0.424	0.351	0.351	0.434	0.476	0.534	**0.840**	0.469	0.354	0.516	0.288
PP2	0.271	0.279	0.249	0.250	0.242	0.311	0.257	0.257	0.318	0.349	0.392	**0.616**	0.344	0.259	0.379	0.211
PL1	0.393	0.406	0.362	0.363	0.351	0.451	0.374	0.374	0.462	0.507	**0.814**	0.518	0.499	0.377	0.550	0.307
PL2	0.425	0.438	0.390	0.392	0.379	0.487	0.403	0.404	0.498	0.548	**0.879**	0.559	0.539	0.407	0.594	0.331
PL4	0.391	0.403	0.359	0.361	0.349	0.448	0.371	0.371	0.459	0.504	**0.809**	0.514	0.496	0.374	0.546	0.305
CONN 1	0.326	0.336	0.300	0.301	0.291	0.374	0.309	0.310	0.383	**0.756**	0.471	0.429	0.414	0.312	0.456	0.254
CONN 2	0.318	0.328	0.292	0.294	0.284	0.365	0.302	0.302	0.373	**0.738**	0.460	0.418	0.403	0.304	0.445	0.248
CONN 3	0.343	0.354	0.316	0.317	0.306	0.394	0.326	0.326	0.403	**0.797**	0.497	0.452	0.436	0.329	0.480	0.268
CONN 4	0.323	0.334	0.297	0.299	0.288	0.371	0.307	0.307	0.379	**0.750**	0.468	0.425	0.410	0.310	0.452	0.252
RES1	0.327	0.337	0.301	0.302	0.292	0.375	0.311	0.311	**0.834**	0.422	0.473	0.430	0.415	0.313	0.457	0.255
RES2	0.280	0.289	0.258	0.259	0.250	0.321	0.266	0.266	**0.714**	0.361	0.405	0.369	0.355	0.268	0.392	0.218
TWC2	0.205	0.212	0.189	0.371	0.358	0.460	0.381	**0.721**	0.269	0.295	0.331	0.301	0.233	0.176	0.257	0.143
TWC4	0.209	0.216	0.192	0.377	0.364	0.468	0.388	**0.733**	0.273	0.300	0.337	0.306	0.237	0.179	0.261	0.146
TWC6	0.212	0.219	0.195	0.382	0.369	0.475	0.393	**0.743**	0.277	0.304	0.341	0.311	0.240	0.181	0.265	0.148
CON1	0.219	0.226	0.201	0.394	0.381	0.490	**0.768**	0.406	0.286	0.314	0.352	0.321	0.248	0.187	0.273	0.152
CON2	0.176	0.181	0.161	0.317	0.306	0.393	**0.617**	0.326	0.230	0.252	0.283	0.257	0.199	0.150	0.219	0.122
CON3	0.242	0.250	0.223	0.437	0.422	0.543	**0.852**	0.450	0.317	0.348	0.391	0.356	0.275	0.207	0.303	0.169
ACN1	0.25	0.258	0.230	0.451	0.436	**0.728**	0.464	0.465	0.327	0.360	0.403	0.367	0.284	0.214	0.313	0.174
ACN2	0.225	0.232	0.207	0.406	0.392	**0.655**	0.418	0.418	0.295	0.324	0.363	0.330	0.255	0.193	0.281	0.157
PBC1	0.193	0.200	0.178	0.349	**0.723**	0.433	0.359	0.359	0.253	0.278	0.312	0.284	0.219	0.165	0.242	0.135
PBC2	0.226	0.233	0.208	0.408	**0.845**	0.507	0.419	0.420	0.296	0.325	0.364	0.331	0.256	0.193	0.282	0.157
PBC3	0.216	0.223	0.199	0.390	**0.808**	0.484	0.401	0.401	0.283	0.310	0.348	0.317	0.245	0.185	0.270	0.150
SIN1	0.186	0.192	0.171	**0.672**	0.324	0.417	0.345	0.346	0.243	0.268	0.300	0.273	0.211	0.159	0.233	0.130
SIN2	0.229	0.236	0.211	**0.827**	0.399	0.513	0.425	0.425	0.300	0.329	0.369	0.336	0.260	0.196	0.286	0.160

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SIN3	0.218	0.225	0.201	**0.789**	0.380	0.489	0.405	0.405	0.286	0.314	0.352	0.320	0.248	0.187	0.273	0.152
SIN4	0.205	0.211	0.188	**0.740**	0.357	0.459	0.380	0.38	0.268	0.294	0.330	0.300	0.232	0.175	0.256	0.143
ISH2	0.380	0.393	**0.834**	0.212	0.205	0.264	0.218	0.219	0.301	0.331	0.371	0.337	0.325	0.245	0.358	0.200
ISH3	0.400	0.412	**0.876**	0.223	0.215	0.277	0.229	0.230	0.316	0.347	0.389	0.354	0.341	0.257	0.376	0.210
ISH4	0.330	0.341	**0.725**	0.184	0.178	0.229	0.190	0.190	0.261	0.287	0.322	0.293	0.282	0.213	0.311	0.173
RB2	0.447	**0.873**	0.411	0.250	0.241	0.310	0.257	0.257	0.353	0.388	0.436	0.396	0.381	0.288	0.420	0.234
RB3	0.45	**0.879**	0.414	0.251	0.243	0.312	0.258	0.258	0.356	0.391	0.438	0.399	0.384	0.290	0.423	0.236
PI1	**0.816**	0.418	0.372	0.226	0.218	0.281	0.232	0.233	0.320	0.352	0.395	0.359	0.345	0.261	0.381	0.212
PI2	**0.969**	0.496	0.442	0.268	0.259	0.333	0.276	0.276	0.380	0.418	0.468	0.426	0.410	0.309	0.452	0.252
PI3	**0.859**	0.439	0.392	0.238	0.230	0.295	0.244	0.245	0.337	0.370	0.415	0.377	0.363	0.274	0.400	0.223

We performed an heterotrait-monotrait (HTMT) analysis (Henseler *et al.*, 2015) of first order constructs, as shown in Table 16, to evaluate discriminant validity by the heterotrait-monotrait ratio of correlations. All values are below the liberal cut-off of 0.90, and just one value is slightly greater than the strict threshold of 0.85 (defence, DE*i*, and recommendation, RE*i*). Also, the value of the square root of the AVE of each construct, shown in the diagonal, is larger than its correlations with other constructs, except for DE*i* and RE*i*.

Table 16. Discriminant validity HTMT for first order constructs*

	UFE*i*	DE*i*	HE*i*	RE*i*	PP*i*	PL*i*	CONN*i*	RES*i*	TWC*i*	CON*i*	ACN*i*	PBC*i*	SIN*i*	ISH*i*	RB*i*	PI*i*
UFE*i*	**0.794**															
DE*i*	0.532	**0.822**														
HE*i*	0.563	0.708	**0.837**													
REi	0.433	0.863	0.564	**0.899**												
PP*i*	0.551	0.649	0.502	0.580	**0.736**											
PL*i*	0.316	0.674	0.487	0.645	0.622	**0.834**										
CONN*i*	0.339	0.553	0.477	0.554	0.571	0.644	**0.760**									
RES*i*	0.382	0.514	0.388	0.476	0.609	0.538	0.485	**0.776**								
TWC*i*	0.282	0.393	0.345	0.390	0.539	0.511	0.535	0.499	**0.732**							
CON*i*	0.207	0.347	0.310	0.394	0.403	0.548	0.458	0.425	0.588	**0.751**						
ACN*i*	0.245	0.322	0.274	0.423	0.412	0.536	0.410	0.544	0.555	0.658	**0.692**					
PBC*i*	0.234	0.270	0.191	0.321	0.348	0.331	0.332	0.336	0.440	0.426	0.847	**0.793**				
SIN*i*	0.141	0.385	0.233	0.399	0.375	0.478	0.453	0.439	0.545	0.569	0.564	0.540	**0.758**			
ISH*i*	0.570	0.544	0.554	0.506	0.589	0.386	0.438	0.436	0.408	0.258	0.279	0.241	0.316	**0.814**		
RB*i*	0.261	0.433	0.401	0.396	0.392	0.539	0.426	0.322	0.366	0.353	0.322	0.194	0.337	0.465	**0.876**	
PI*i*	0.302	0.426	0.476	0.391	0.409	0.527	0.502	0.378	0.395	0.338	0.255	0.194	0.278	0,414	0.602	**0.883**

* Correlations between the dimensions and square root of the AVE on the diagonal (bold). Gaskin & James´s (2019) HTMT Plugin for Amos.

4.5.5. Revised discriminant validity and common method variance

We address the problem of discriminant validity in first order constructs by *'eliminating items that are strongly correlated with items in the opposing construct'* (Henseler, Ringle, & Sarstedt, 2015:130). Therefore, we eliminate RE1, *'I refer fellow students or co-workers to Instagram'*, to

facilitate discriminant validity between defence (DE*i*) and recommendation (RE*i*). Once RE1 is removed, there are no further issues for this HTMT analysis, as shown in Table 17.

Table 17. Discriminant validity HTMT for first order constructs without RE1*

	UFE*i*	DE*i*	HE*i*	RE*i*	PP*i*	PL*i*	CONN*i*	RES*i*	TWC*i*	CON*i*	ACN*i*	PBC*i*	SIN*i*	ISH*i*	RB*i*	PI*i*
UFE*i*	**0.794**															
DE*i*	0.532	**0.822**														
HE*i*	0.563	**0.708**	**0.837**													
REi	0.407	**0.844**	0.536	**0.899**												
PP*i*	0.551	0.649	0.502	0.577	**0.736**											
PL*i*	0.316	0.674	0.487	0.649	0.622	**0.834**										
CONN*i*	0.339	0.553	0.477	0.549	0.571	0.644	**0.760**									
RES*i*	0.382	0.514	0.388	0.467	0.609	0.538	0.485	**0.776**								
TWC*i*	0.282	0.393	0.345	0.379	0.539	0.511	0.535	0.499	**0.732**							
CON*i*	0.207	0.347	0.310	0.391	0.403	0.548	0.458	0.425	0.588	**0.751**						
ACN*i*	0.245	0.322	0.274	0.435	0.412	0.536	0.410	0.544	0.555	0.658	**0.692**					
PBC*i*	0.234	0.270	0.191	0.317	0.348	0.331	0.332	0.336	0.440	0.426	0.847	**0.793**				
SIN*i*	0.141	0.385	0.233	0.395	0.375	0.478	0.453	0.439	0.545	0.569	0.564	0.540	**0.758**			
ISH*i*	0.570	0.544	0.554	0.479	0.589	0.386	0.438	0.436	0.408	0.258	0.279	0.241	0.316	**0.814**		
RB*i*	0.261	0.433	0.401	0.378	0.392	0.539	0.426	0.322	0.366	0.353	0.322	0.194	0.337	0.465	**0.876**	
PI*i*	0.302	0.426	0.476	0.379	0.409	0.527	0.502	0.378	0.395	0.338	0.255	0.194	0.278	0.414	0.602	**0.883**

* Correlations between the dimensions and square root of the AVE on the diagonal (bold). Gaskin & James´s (2019) HTMT Plugin for Amos.

Consequently, the measurement model is analysed again. Tables 19, 20 and 21 show no further issues with discriminant validity (Tables 19 and 20) and internal consistency (Table 20). In fact, the implied correlations between factors shown in Table 18 indicate that items are more correlated with the factor to which they belong. However, it can also be observed that some items are correlated with other factors, but to a lesser extent. This means that significant cross-loadings should differ by more than 0.2 (Gaskin, 2012). Also, the factorial correlation matrix shown in Table 19 points out that no factorial value is > 0.70, besides the value in the diagonal (Gaskin, 2012).

Similarly, the results shown in Table 20, indicate that items and constructs have a high level of reliability (internal consistency), since all Cronbach's α rates exceed the minimum cut-off limit of 0.60 (Hair, Black, Babin, & Anderson, 2010) and even the more restrictive value of 0.70 (Grande-Esteban & Abascal-Fernández, 2007). In addition, the item-to-total correlation of all items seems above the minimum cut-off limit of 0.40 (Loiacono *et al*., 2002).

Table 18. Implied correlations for the discriminant validity of first order constructs without RE1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
UFE1	0.195	0.201	0.178	0.142	0.137	0.177	0.143	0.145	0.230	0.252	0.283	0.258	0.354	0.274	0.397	**0.745**
UFE2	0.219	0.226	0.201	0.160	0.154	0.199	0.161	0.164	0.259	0.284	0.319	0.291	0.399	0.309	0.447	**0.840**
DE1	0.329	0.339	0.301	0.239	0.232	0.299	0.241	0.245	0.388	0.426	0.479	0.436	0.599	0.463	**0.706**	0.376
DE2	0.403	0.415	0.369	0.293	0.284	0.366	0.296	0.301	0.475	0.522	0.587	0.534	0.734	0.567	**0.866**	0.461
DE3	0.412	0.425	0.378	0.300	0.290	0.375	0.303	0.308	0.486	0.534	0.600	0.547	0.751	0.581	**0.886**	0.472
HE1	0.286	0.295	0.262	0.208	0.201	0.260	0.210	0.214	0.337	0.371	0.416	0.379	0.521	**0.890**	0.583	0.327

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
HE2	0.294	0.303	0.270	0.214	0.207	0.267	0.216	0.220	0.347	0.382	0.429	0.390	0.536	**0.916**	0.600	0.337
HE3	0.257	0.265	0.236	0.187	0.181	0.234	0.189	0.192	0.304	0.334	0.375	0.341	0.469	**0.801**	0.525	0.295
HE4	0.235	0.243	0.216	0.171	0.166	0.214	0.173	0.176	0.278	0.305	0.343	0.312	0.429	**0.732**	0.480	0.269
RE2	0.367	0.379	0.337	0.268	0.259	0.334	0.270	0.274	0.434	0.476	0.535	0.487	**0.884**	0.518	0.749	0.421
RE3	0.392	0.404	0.359	0.285	0.276	0.356	0.288	0.293	0.462	0.508	0.571	0.519	**0.943**	0.552	0.799	0.448
PP1	0.371	0.382	0.340	0.338	0.327	0.422	0.341	0.347	0.434	0.477	0.536	**0.841**	0.463	0.359	0.519	0.291
PP2	0.271	0.279	0.248	0.247	0.239	0.309	0.249	0.254	0.317	0.349	0.392	**0.615**	0.339	0.262	0.380	0.213
PL1	0.394	0.406	0.361	0.359	0.348	0.448	0.362	0.368	0.461	0.507	**0.814**	0.518	0.492	0.381	0.551	0.309
PL2	0.425	0.439	0.390	0.388	0.375	0.484	0.391	0.398	0.498	0.547	**0.879**	0.560	0.532	0.412	0.596	0.334
PL4	0.391	0.403	0.359	0.357	0.345	0.445	0.360	0.366	0.458	0.503	**0.808**	0.515	0.489	0.378	0.548	0.307
CONN1	0.326	0.336	0.299	0.297	0.287	0.371	0.300	0.305	0.381	**0.756**	0.471	0.429	0.407	0.315	0.456	0.256
CONN2	0.318	0.328	0.291	0.290	0.281	0.362	0.292	0.297	0.372	**0.738**	0.459	0.418	0.398	0.308	0.445	0.250
CONN3	0.343	0.354	0.315	0.313	0.303	0.391	0.316	0.321	0.402	**0.797**	0.496	0.452	0.429	0.332	0.481	0.270
CONN4	0.323	0.333	0.296	0.295	0.285	0.368	0.297	0.302	0.379	**0.750**	0.467	0.425	0.404	0.313	0.453	0.254
RES1	0.327	0.337	0.300	0.298	0.288	0.372	0.301	0.306	**0.834**	0.421	0.472	0.430	0.409	0.316	0.458	0.257
RES2	0.280	0.289	0.257	0.256	0.247	0.319	0.258	0.262	**0.714**	0.360	0.405	0.369	0.350	0.271	0.392	0.220
TWC2	0.202	0.209	0.186	0.371	0.359	0.463	0.374	**0.721**	0.264	0.29	0.326	0.297	0.224	0.173	0.250	0.141
TWC4	0.206	0.213	0.189	0.378	0.366	0.472	0.381	**0.735**	0.269	0.296	0.333	0.303	0.228	0.176	0.255	0.143
TWC6	0.208	0.215	0.191	0.382	0.370	0.477	0.385	**0.742**	0.272	0.299	0.336	0.306	0.230	0.178	0.258	0.145
CON1	0.204	0.211	0.187	0.374	0.362	0.467	**0.740**	0.384	0.267	0.293	0.329	0.300	0.226	0.174	0.253	0.142
CON2	0.183	0.189	0.168	0.336	0.325	0.419	**0.664**	0.344	0.239	0.263	0.295	0.269	0.202	0.157	0.227	0.127
CON3	0.244	0.252	0.224	0.448	0.433	0.559	**0.885**	0.459	0.319	0.351	0.394	0.358	0.270	0.209	0.302	0.170
ACN1	0.249	0.257	0.229	0.457	0.442	**0.729**	0.460	0.468	0.326	0.358	0.402	0.366	0.275	0.213	0.308	0.173
ACN2	0.223	0.230	0.205	0.409	0.396	**0.653**	0.412	0.420	0.292	0.320	0.360	0.328	0.247	0.191	0.276	0.155
PBC1	0.192	0.198	0.176	0.352	**0.724**	0.439	0.354	0.360	0.250	0.275	0.309	0.281	0.212	0.164	0.237	0.133
PBC2	0.224	0.231	0.205	0.411	**0.846**	0.512	0.414	0.421	0.293	0.321	0.361	0.329	0.247	0.191	0.277	0.156
PBC3	0.214	0.221	0.196	0.392	**0.807**	0.489	0.395	0.402	0.279	0.307	0.345	0.314	0.236	0.183	0.265	0.148
SIN1	0.184	0.190	0.169	**0.672**	0.326	0.421	0.340	0.346	0.241	0.264	0.297	0.270	0.203	0.157	0.228	0.128
SIN2	0.227	0.234	0.208	**0.827**	0.402	0.518	0.419	0.426	0.296	0.325	0.365	0.332	0.250	0.194	0.280	0.157
SIN3	0.216	0.223	0.198	**0.789**	0.383	0.494	0.399	0.406	0.282	0.310	0.348	0.317	0.239	0.185	0.267	0.150
SIN4	0.203	0.209	0.186	**0.740**	0.359	0.464	0.375	0.381	0.265	0.291	0.327	0.298	0.224	0.173	0.251	0.141
ISH2	0.380	0.392	**0.834**	0.210	0.203	0.262	0.211	0.215	0.300	0.330	0.370	0.337	0.318	0.246	0.356	0.200
ISH3	0.399	0.412	**0.876**	0.220	0.213	0.275	0.222	0.226	0.315	0.346	0.389	0.354	0.334	0.258	0.374	0.210
ISH4	0.330	0.341	**0.725**	0.182	0.176	0.227	0.183	0.187	0.260	0.286	0.321	0.293	0.276	0.213	0.309	0.173
RB2	0.448	**0.873**	0.411	0.247	0.239	0.308	0.249	0.253	0.353	0.388	0.436	0.397	0.374	0.289	0.419	0.235
RB3	0.451	**0.879**	0.413	0.248	0.240	0.310	0.250	0.255	0.355	0.391	0.439	0.399	0.377	0.291	0.422	0.237
PI1	**0.816**	0.419	0.372	0.224	0.216	0.279	0.225	0.229	0.320	0.352	0.395	0.360	0.339	0.262	0.380	0.213
PI2	**0.969**	0.497	0.442	0.266	0.257	0.331	0.268	0.272	0.380	0.417	0.469	0.427	0.402	0.311	0.451	0.253
PI3	**0.859**	0.440	0.391	0.235	0.228	0.294	0.237	0.241	0.337	0.370	0.415	0.378	0.357	0.276	0.399	0.224

Table 19. Factorial correlation matrix without RE1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	**1.000**	0.552	0.206	0.450	0.471	0.225	0.511	0.332	0.281	0.488	0.388	0.395	0.496	0.468	0.588	-0.138

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2	0.552	**1.000**	0.356	0.518	0.393	0.363	0.446	0.420	0.320	0.648	0.389	0.472	0.392	0.586	0.657	-0.110
3	0.206	0.356	**1.000**	0.396	0.231	0.477	0.272	0.488	0.504	0.404	0.313	0.379	0.086	0.341	0.258	0.080
4	0.450	0.518	0.396	**1.000**	0.463	0.342	0.397	0.445	0.464	0.585	0.403	0.437	0.285	0.510	0.396	-0.082
5	0.471	0.393	0.231	0.463	**1.000**	0.202	0.395	0.360	0.348	0.502	0.574	0.386	0.263	0.344	0.323	-0.183
6	0.225	0.363	0.477	0.342	0.202	**1.000**	0.195	0.413	0.356	0.368	0.234	0.363	0.183	0.379	0.193	0.064
7	0.511	0.446	0.272	0.397	0.395	0.195	**1.000**	0.237	0.325	0.328	0.413	0.365	0.490	0.499	0.403	-0.048
8	0.332	0.420	0.488	0.445	0.360	0.413	0.237	**1.000**	0.513	0.543	0.391	0.411	0.174	0.393	0.268	-0.133
9	0.281	0.320	0.504	0.464	0.348	0.356	0.325	0.513	**1.000**	0.409	0.351	0.392	0.210	0.423	0.264	0.089
10	0.488	0.648	0.404	0.585	0.502	0.368	0.328	0.543	0.409	**1.000**	0.510	0.518	0.270	0.535	0.524	-0.076
11	0.388	0.389	0.313	0.403	0.574	0.234	0.413	0.391	0.351	0.510	**1.000**	0.305	0.199	0.365	0.343	-0.100
12	0.395	0.472	0.379	0.437	0.386	0.363	0.365	0.411	0.392	0.518	0.305	**1.000**	0.320	0.549	0.385	-0.032
13	0.496	0.392	0.086	0.285	0.263	0.183	0.490	0.174	0.210	0.270	0.199	0.320	**1.000**	0.477	0.434	-0.065
14	0.468	0.586	0.341	0.510	0.344	0.379	0.499	0.393	0.423	0.535	0.365	0.549	0.477	**1.000**	0.500	-0.081
15	0.588	0.657	0.258	0.396	0.323	0.193	0.403	0.268	0.264	0.524	0.343	0.385	0.434	0.500	**1.000**	-0.158
16	-0.138	-0.110	0.080	-0.082	-0.183	0.064	-0.048	-0.133	0.089	-0.076	-0.100	-0.032	-0.065	-0.081	-0.158	**1.000**

Table 20. Internal consistency analysis without RE1*

Second order factors	First order factors	Item	Cronbach `s α	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation
CCB	UFE*i*	UFE1	0.770	237.583	1,584.234	0.408	0.495
		UFE2		237.130	1,572.534	0.453	0.510
	DE*i*	DE1	0.860	236.340	1,565.819	0.580	0.562
		DE2		236.265	1,554.190	0.653	0.733
		DE3		236.470	1,551.327	0.662	0.783
	HE*i*	HE1	0.902	236.024	1,573.854	0.573	0.784
		HE2		236.075	1,577.982	0.553	0.794
		HE3		236.176	1,572.363	0.573	0.662
		HE4		236.434	1,571.855	0.552	0.626
	RE*i*	RE2	0.909	236.639	1,555.067	0.643	0.758
		RE3		236.294	1,557.000	0.672	0.799
NI	PP*i*	PP1	0.682	236.202	1,572.215	0.594	0.544
		PP2		237.270	1,580.487	0.474	0.435
	PL*i*	PL1	0.871	235.812	1,582.081	0.618	0.624
		PL2		235.706	1,582.295	0.648	0.701

Second order factors	First order factors	Item	Cronbach `s α	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation
		PL4		235.814	1,582.562	0.639	0.634
	CONN*i*	CONN1	0.846	235.957	1,587.834	0.571	0.583
		CONN2		236.157	1,588.558	0.537	0.557
		CONN3		236.118	1,581.829	0.597	0.594
		CONN4		236.135	1,594.813	0.502	0.559
	RES*i*	RES1	0.747	236.487	1,584.154	0.542	0.526
		RES2		237.224	1,586.474	0.475	0.476
PI	TWC*i*	TWC2	0.776	236.745	1,577.007	0.513	0.472
		TWC4		237.446	1,581.982	0.473	0.489
		TWC6		236.530	1,583.337	0.507	0.510
	CON*i*	CON1	0.782	235.737	1,595.880	0.510	0.572
		CON2		237.029	1,593.217	0.383	0.476
		CON3		236.142	1,588.847	0.496	0.584
	ACN*i*	ACN1	0.645	236.937	1,588.914	0.471	0.509
		ACN2		236.793	1,579.372	0.443	0.546
	PBC*i*	PBC1	0.832	237.347	1,583.155	0.456	0.515
		PBC2		237.402	1,583.574	0.400	0.669
		PBC3		236.819	1,587.400	0.426	0.599
	SIN*i*	SIN1	0.841	236.342	1,590.013	0.474	0.495
		SIN2		236.781	1,586.529	0.478	0.621
		SIN3		237.104	1,591.678	0.458	0.593
		SIN4		236.725	1,588.089	0.490	0.552
CPB	ISH*i*	ISH2	0.849	236.453	1,579.388	0.506	0.636
		ISH3		236.660	1,573.563	0.543	0.693
		ISH4		236.619	1,575.439	0.522	0.573
	RB*i*	RB2	0.869	236.451	1,609.741	0.489	0.657
		RB3		236.417	1,609.403	0.494	0.648

Second order factors	First order factors	Item	Cronbach `s α	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation
	PI*i*	PI1	0.908	235.381	1,607.232	0.480	0.669
		PI2		235.265	1,609.833	0.524	0.822
		PI3		235.142	1,616.692	0.517	0.765

*Overall rotated Cronbach's α =0.946 and rotated standardised Cronbach's α =0.949

We propose a final model in Table 21 and Figure 15 with first order constructs having a factor loading > 0.60, except for UFE*i* (factor loading = 0.547) – which is kept for theoretical purposes. Similarly, we keep items PP2, ACN2, CON2 and SIN1, with factor loadings < 0.70 for theoretical purposes.

Table 21. The CFA of the measurement model without RE1

	Construct		Item	Factor loading	CR	AVE
Second order factors (main constructs)						
	CCB	→	UFE*i*	0.547	0.859	0.614
		→	DE*i*	0.974		
		→	HE*i*	0.673		
		→	RE*i*	0.870		
	NI	→	PP*i*	0.761	0.842	0.573
		→	PL*i*	0.836		
		→	CONN*i*	0.745		
		→	RES*i*	0.678		
	PI	→	TWC*i*	0.726	0.862	0.558
		→	CON*i*	0.714		
		→	ACN*i*	0.884		
		→	PBC*i*	0.685		
		→	SIN*i*	0.709		
	CPB	→	ISH*i*	0.727	0.735	0.481
		→	RB*i*	0.705		

	Construct		Item	Factor loading	CR	AVE
		→	PI*i*	0.646		
First order factors (subcontracts)						
CCB	UFE*i*	→	UFE1	0.745	0.773	0.630
		→	UFE2	0.840		
	DE*i*	→	DE1	0.706	0.862	0.678
		→	DE2	0.866		
		→	DE3	0.886		
	HE*i*	→	HE1	0.890	0.903	0.702
		→	HE2	0.916		
		→	HE3	0.801		
		→	HE4	0.732		
	RE*i*	→	RE2	0.884	0.910	0.835
		→	RE3	0.943		
NI	PPi	→	PP1	0.841	0.699	0.543
		→	PP2	0.615		
	PL*i*	→	PL1	0.814	0.873	0.696
		→	PL2	0.879		
		→	PL4	0.808		
	CONN*i*	→	CONN1	0.756	0.846	0.578
		→	CONN2	0.738		
		→	CONN3	0.797		
		→	CONN4	0.750		
	RES*i*	→	RES1	0.834	0.751	0.603
		→	RES2	0.714		
PI	TWC*i*	→	TWC2	0.721	0.777	0.537
		→	TWC4	0.735		
		→	TWC6	0.742		

	Construct		Item	Factor loading	CR	AVE
	CON*i*	→	CON1	0.740	0.810	0.591
		→	CON2	0.664		
		→	CON3	0.885		
	ACN*i*	→	ACN1	0.729	0.647	0.479
		→	ACN2	0.653		
	PBC*i*	→	PBC1	0.724	0.836	0.630
		→	PBC2	0.846		
		→	PBC3	0.807		
	SIN*i*	→	SIN1	0.672	0.844	0.576
		→	SIN2	0.827		
		→	SIN3	0.789		
		→	SIN4	0.740		
CPB	ISH*i*	→	ISH2	0.834	0.854	0.663
		→	ISH3	0.876		
		→	ISH4	0.725		
	RB*i*	→	RB2	0.873	0.868	0.767
		→	RB3	0.879		
	PI*i*	→	PI1	0.816	0.914	0.781
		→	PI2	0.969		
		→	PI3	0.859		

Note: CFA measurements: RMSEA=0.052; CFI=0.908; TLI=0.901; ChiSq/df=2.121.

Finally, we applied two post hoc statistical techniques to discard any problematic common method variance (CMV) interfering in data analysis: Harman's single-factor test and the common latent factor (CLF) technique. First, in the unrotated factor analysis of the items there is no single component explaining more than the 50% of the variance. In fact, the first factor explains 38.36% of the variance. Hence the Harman's single-factor test concludes that there is no evidence of CMV in the sample (Harman, 1976). Second, we perform a common latent factor (CLF) technique of the observed (manifest) measured items (Eichhorn, 2014) of the final model without RE1. We show in Table 23 that almost all delta values between the standardized regression weights with and without CLF are lower than the recommended cut-off 0.3 (Lindell & Whitney, 2001). We only found four items that are above the threshold of 0.3: PP2, TWC6, CON1 and ACN1. Since they belong to different constructs, they pose no problem (Benjamin & Gaskin, 2014). These results also support the idea that our data does not have significant CMV biases.

Table 23. Delta between the standardised regression weights with and without CLF

Standardised regression weight with CLF				Standardised regression weight no CLF				Delta
Construct		Item	Estimate	Construct		Item	Estimate	
UFE*i*	→	UFE1	0.705	UFE*i*	→	UFE1	0.745	0.040
	→	UFE2	0.794		→	UFE2	0.840	0.046
DE*i*	→	DE1	0.580	DE*i*	→	DE1	0.706	0.126
	→	DE2	0.759		→	DE2	0.866	0.107
	→	DE3	0.766		→	DE3	0.886	0.120
HE*i*	→	HE1	0.813	HE*i*	→	HE1	0.890	0.077
	→	HE2	0.873		→	HE2	0.916	0.043
	→	HE3	0.689		→	HE3	0.801	0.112
	→	HE4	0.61		→	HE4	0.732	0.122
RE*i*	→	RE2	0.743	RE*i*	→	RE2	0.884	0.141
	→	RE3	0.810		→	RE3	0.943	0.133
PPi	→	PP1	1.200	PPi	→	PP1	0.841	-0.359
	→	PP2	0.277		→	PP2	0.615	0.338
PL*i*	→	PL1	0.589	PL*i*	→	PL1	0.814	0.225
	→	PL2	0.712		→	PL2	0.879	0.167
	→	PL4	0.529		→	PL4	0.808	0.279
CONN*i*	→	CONN1	0.527	CONN*i*	→	CONN1	0.756	0.229
	→	CONN2	0.611		→	CONN2	0.738	0.127
	→	CONN3	0.590		→	CONN3	0.797	0.207
	→	CONN4	0.593		→	CONN4	0.750	0.157
RES*i*	→	RES1	0.701	RES*i*	→	RES1	0.834	0.133
	→	RES2	0.567		→	RES2	0.714	0.147
TWC*i*	→	TWC2	0.432	TWC*i*	→	TWC2	0.721	0.289
	→	TWC4	0.553		→	TWC4	0.735	0.182
	→	TWC6	0.431		→	TWC6	0.742	0.311
CON*i*	→	CON1	0.315	CON*i*	→	CON1	0.740	0.425

	→	CON2	0.477		→	CON2	0.664	0.187
	→	CON3	1.071		→	CON3	0.885	-0.186
ACN*i*	→	ACN1	0.394	ACN*i*	→	ACN1	0.729	0.335
	→	ACN2	0.762		→	ACN2	0.653	-0.109
PBC*i*	→	PBC1	0.586	PBC*i*	→	PBC1	0.724	0.138
	→	PBC2	0.885		→	PBC2	0.846	-0.039
	→	PBC3	0.698		→	PBC3	0.807	0.109
SIN*i*	→	SIN1	0.423	SIN*i*	→	SIN1	0.672	0.249
	→	SIN2	0.668		→	SIN2	0.827	0.159
	→	SIN3	0.685		→	SIN3	0.789	0.104
	→	SIN4	0.538		→	SIN4	0.740	0.202
ISH*i*	→	ISH2	0.764	ISH*i*	→	ISH2	0.834	0.070
	→	ISH3	0.778		→	ISH3	0.876	0.098
	→	ISH4	0.608		→	ISH4	0.725	0.117
RB*i*	→	RB2	0.769	RB*i*	→	RB2	0.873	0.104
	→	RB3	0.747		→	RB3	0.879	0.132
PI*i*	→	PI1	0.706	PI*i*	→	PI1	0.816	0.110
	→	PI2	0.905		→	PI2	0.969	0.064
	→	PI3	0.727		→	PI3	0.859	0.132

4.6. Structural model

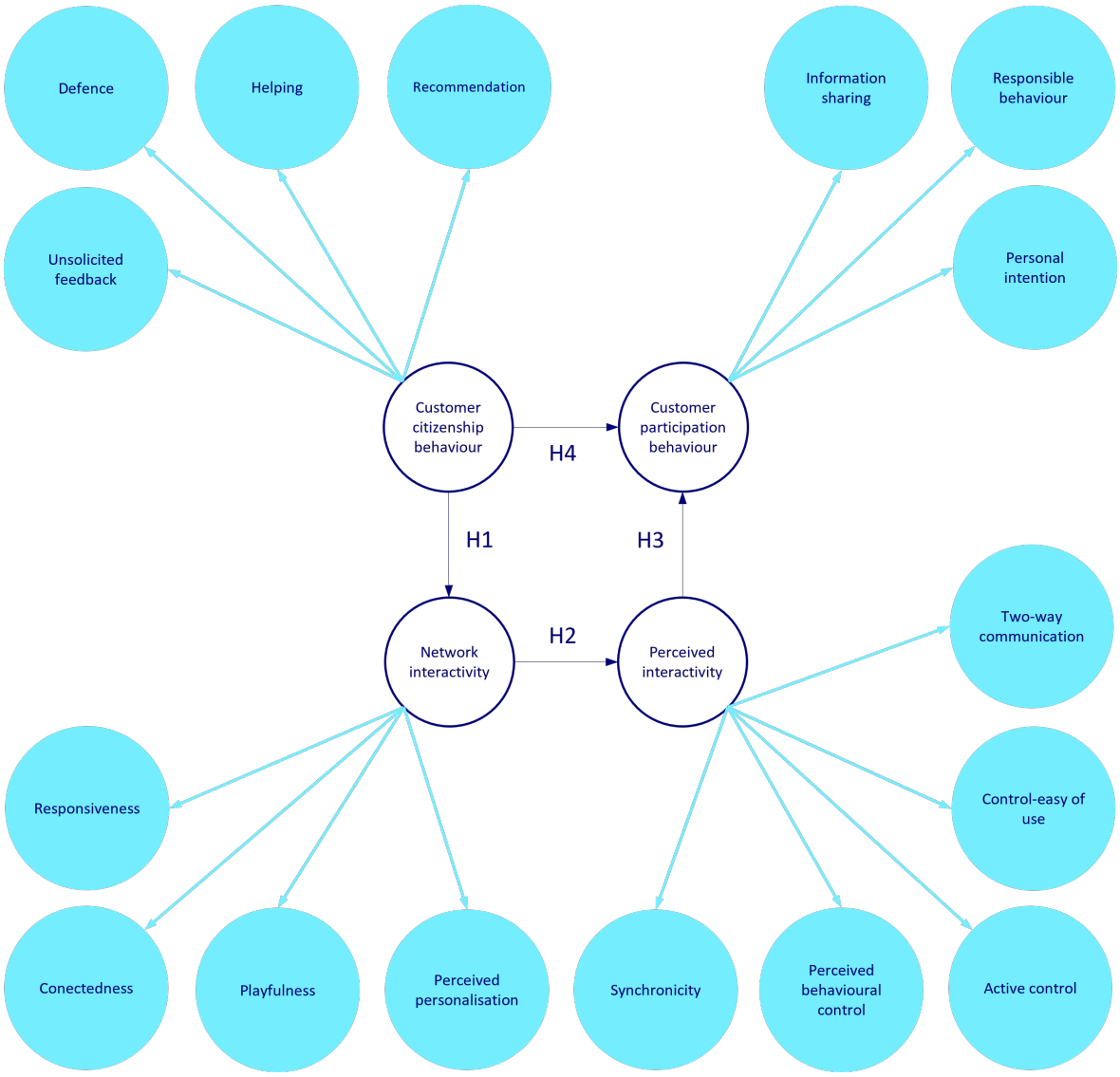
When conducting CFA, researchers employ the measurement model to estimate the covariance matrix of a population compared to the observed covariance matrix. Researchers aim to minimise the difference between the theorised matrix and the observed matrix numerically (Schreiber *et al.*, 2006):

The structural model shows the causal interrelations between latent constructs in the path analysis; these links are established from the beginning of the research by considering the theoretical background. The structural model establishes the links between the latent variables in the path analysis through several structural equations that are equivalent to a series of regression equations (Schreiber *et al.*, 2006).

The structural model (see Figure 12) includes the other component of SEM. In a hierarchical CFA, as we initially know the observed variables that define their respective latent variable, we can

assess whether the estimation of the model can verify the initial hypotheses. After evaluating the measurement model, we reach the last step of the structural model (see Figure 15).

Figure 15. Constructs and dimensions in the final model*



The second step of the data analysis consists of a SEM estimation of the structural (or path) model using the maximum likelihood approach (Schreiber *et al.*, 2006). A SEM estimate minimises the differences (distances) that link the correlation matrix of the observed variable (or the covariance of the data input) and the correlation matrix of the model (or the covariance of the model). A maximum likelihood estimation (MLE) is used during this iterative optimisation method.

The main assumption in the use of the original data during the MLE optimisation process implies that: (1) the distribution of the observed variables is independent; (2) the variables are identically distributed; and (3) they are jointly defined as multivariate and normally distributed. However, as seen in Table 7, we have nonnormally distributed data. Therefore, we use the Bollen-Stine bootstrapping method with 5000 resamples (Byrne, 2010) and Amos version 25 to estimate the properties of the covariance of the empirical function of the observed data by measuring from an

approximation distribution. Since we assume that the sample is (1) and (2), we build a series of resamples with replacement from the observed data set (and of equal size).

A set of observations is assumed to be from a population that is independent and identically distributed by constructing a number of resamples with replacement of the observed data set (and of equal size to the observed data set). However, sometimes this assumption can be relaxed, and we simply accept that there is not too much kurtosis, which means that the figures of a probability distribution and a normal distribution must be analogous.

This allows us to verify the overall fit of the model and test all hypothesised causal relationships. To analyse the goodness-of-fit of the model, we will consider some fit indices, such as: the $\chi 2$ statistic (*p*-value less than 0.005), the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the standardised root mean residual (SRMR), and the root mean square error of approximation (RMSEA).

The goodness of fit index (GFI) must be greater than 0.80 (Sharma, 1996). By adjusting the GFI to the number of parameters (AGFI) and paths (PGFI), we should reach values greater than 0.90 (Sharma, 1996) and 0.50 (Mulaik *et al.*, 1989), respectively. Added to this, the standardised root mean square residual (SRMR) must be less than the upper threshold of 0.08 (Byrne, 1998; Diamantopoulos & Siguaw, 2000) and the root mean square error of approximation (RMSEA) (which is the population covariance matrix of the model) should be less than 0.08 (MacCallum, Browne, & Sugawara, 1996). Below is a complete list of the fit indices.

4.6.1. Fit indices

Three different sets of goodness-of-fit measures are frequently used to confirm our model: absolute fit indices or normed fit index, incremental fit indices or non-normed fit index and parsimonious indices, or the comparative fit index (Ho, 2006).

- The absolute fit measures with respect to the number of estimated coefficients will be the normed chi-square ($\chi 2/df$) where *df* is the degree of freedom, the root-mean-square error of approximation (RMSEA), the goodness-of-fit (GFI), the adjusted goodness-of-fit statistic (AGFI) and the standardised root means square residual (SRMR).

- We will consider the three different incremental fit indexes to weigh the proposed model against the null model. The incremental fit measures with respect to the number of estimated coefficients will be the comparative fit index (CFI), the normed fit index (NFI), the incremental fit index (IFI), which is a better fix index than the normed fit index and the Tucker-Lewis index (TLI).

- The parsimonious fit measures related to the goodness of fit will be the parsimonious goodness of fit index (PGFI), the parsimonious normed fit index (PNFI) and the parsimonious comparative fit index (PCFI).

In Table 23, there is a detailed description of the fit indices, and in the following subsections, we will analyse the values obtained for them.

Table 23. Fit indices for the structural model

Fit index	Value	Recommended cut-off values	Conclusion
Absolute fit measures			
χ^2	1,991.733	The lower the better	
d.f	924		
p-value	0.000	> 0.05 not significant	
χ^2/d.f.	2.156	< 5	Good fit
GFI	0.817	> 0.80	Good fit
AGFI	0.795	> 0.80	Bad fit
SRMR	0.065	< 0.08	Good fit
RMSEA	0.053	< 0.08	Good fit
Incremental fit measures			
NFI	0.837	> 0.90	Bad fit
IFI	0.906	> 0.90	Good fit
TLI	0.898	> 0.90	Bad fit
CFI	0.905	> 0.90	Good fit
Parsimonious fit measures			
PGFI	0.729	> 0.50	Good fit
PNFI	0.781	> 0.50	Good fit
PCFI	0.845	> 0.50	Good fit

4.6.2. Analysis of absolute fit indices

Absolute fit indices describe whether an a-priori model fits the data (Hooper *et al.*, 2008; McDonald & Ho, 2002) and which model has the most appropriate fit. These indices give the most accurate indication of how well the data fit the theory intended. Its calculation is not based on a comparison with a reference model (like incremental fit indices), but on how well the model fits compared to no model of any type (Jöreskog & Long, 1993). The chi-square, the root-mean-square error of approximation, the goodness-of-fit, the adjusted goodness-of-fit and the standardised root mean square residual are all indices belonging to this category.

- The ML Chi-square (χ2) is the likelihood ratio (LR) test performed to: *'assesses the magnitude of discrepancy between the sample and fitted covariances matrices'* (Hu &

Bentler, 1999:2). The fit is calculated by comparing the covariance matrix of the hypothesised model (observed variables) and the real sample (data) (Byrne, 1998). It is non-significant in the limit of 0.05 (Hooper, Coughlan, & Mullen, 2008), since the sample size greatly affects its result (Bentler & Bonett, 1980). Therefore, we propose dividing it by the degree of freedom (*df*) (Wheaton, Muthen, Alwin, & Summers, 1977), and we include in our analysis the parameter of chi-square to *df* ratio χ2/df, which varies between 5 and 2 (Hooper, Coughlan, & Mullen, 2008). In our model, χ2/d.f. takes the value of 1,991.733, which shows a good fit.

- The root-mean-square error of approximation (RMSEA) is determined by the non-centrality parameter. The parameter shows the fit of a model with the population covariance matrix (Hooper, Coughlan, & Mullen, 2008) and indicates the amount of unexplained variance; it is also called residual. RMSEA has zero value if the value of *df* is greater than χ2. The ratio of chi-square to *df* is the penalty for complexity. This ratio tends to be too large because it is biased when the sample size is too small or the *df* is too low. The upper limit is set to 0.08 (McDonald & Ho, 2002), 0.07 (Steiger, 2007) or 0.06 (Hu & Bentler, 1999), since there is no definitive view of the good-fit value amongst researchers. In our model, the RMSA value is 0.053, which indicates a good fit.

- The goodness-of-fit (GFI) compares the relative variance and the covariance between the data of the sample and the hypothesised model. We keep in mind that it compares the hypothesised model with no model. Since it is a normed index, it fluctuates from 0 to 1; the higher the value, the better the fit (Byrne, 1998). Typically the cut-off value is 0.80 (Hooper *et al.*, 2008). In our model, the value is 0.817, which indicates a good fit.

- The adjusted goodness-of-fit statistic (AGFI) is very similar to the GFI, except for AGFI, which is corrected to *df* (Westland, 2015). However, it can give a value that is negative and therefore has no meaning. Also, it can give values higher than 1.0, which are considered to be a perfect fit and 0.90, which are considered a good fit (Gefen, Straub, & Rigdon, 2011). Therefore, AGFI provides better values for the larger sample, similar to GFI. In our model, AGFI values 0.795, which is considered a bad fit due to the cut-off limit of 0.80 (Bentler & Bonett, 1980; Shevlin, Miles, & Lewis, 2000).

- The standardised root mean square residual (SRMR) is a term coined for the first time by Jöreskog & Sorbom (1982). This index is the square root of the average squared residuals; these residuals are the difference between the covariance of the observed data and the covariance of the hypothesised model. SRMR is an absolute index and is the standardised difference between the observed correlation and the hypothesised correlation. It is positively biased towards small values of N and low *df*. Since SRMR is an absolute index, zero means a perfect fit. SRMR does not indicate the parsimony of the model, since the more complex models do not have a worse SRMR. A value of 0.08 is usually a good fit (Hu & Bentler, 1999).

  Since the root means square residual (RMR) is sensitive to the size of the covariance matrix, Bentler (1995) developed the standardised root mean square, which converts the residuals into standard measurements (Hoyle, 2012). The SRMR depends on sample size. Therefore its cut-off value ranges from 0.10 for samples of 250 observations and 0.07 for samples of 500 observations (Sivo, Xitao, Witta, & Willse, 2006). The default cut-off limit is less than 0.08 (Hooper *et al.*, 2008). In our model, the sample size is (415), which implies that the cut-off limit of 0.065 for SRMR is a good fit.

GFI, SRMR and RMSEA have a good fit, but the AGFI shows a bad fit. In section 4.6.5, we fix this bad fit by adjusting the calculations of the error terms.

4.6.3. Analysis of incremental fit indices

The incremental or relative fit indices (McDonald & Ho, 2002; Miles & Shevlin, 2007) and comparative indices (Byrne, 1998) are improvement indices that result from the comparison between the fit of a hypothesised model and a reference (baseline or independent) model (Byrne, 2012a) that is the uncorrelated null model in our case. The incremental fit index juxtaposes the chi-square of the hypothesised model to the reference model, the uncorrelated null model in our case. The uncorrelated null model requires that the variables are uncorrelated (McDonald & Ho, 2002), i.e. there are no latent variables. Since the chi-square of the null model has a high value, the fit is very poor.

The incremental indices are significant for the interpretation of $\chi 2$, since $\chi 2$ is highly influenced by the sample size (Miles & Shevlin, 2007). In addition, the incremental fit indices are very useful as additional indices for model fit (Schmukle & Hardt, 2005) and include the normed fit index and the non-normed fit index (this is the Tucker-Lewis index) and the comparative fit index.

- The normed fit index (NFI) was developed by Bentler and Bonet and showed the increase in the fit by evaluating two hierarchical step-up or improvement models (Bentler & Bonett, 1980). This index contrasts the hypothesised model with the null model at each level of the step-up/improvement (Hooper *et al.*, 2008). In the case that the NFI between the hypothesised model and the unconstrained null model is statistically significant, the hypothesised model should be preferred to the null model if the differences in *df* are insignificant. After NFI showed a sample bias (Byrne, 1998) that underestimated the fit of the models with small samples, Bentler redesigned the NFI to incorporate the sample size as a parameter and developed the CFI. The NFI values range from 0 to 1, and a value greater than 0.90 implies a good fit. In our model, NFI is 0.837, which shows a bad fit for the model, considering that we have N=415 and 80 measurement variables.

- The incremental adjustment index (IFI) was developed by Bollen (1989). Like the NFI, CFI, TLI, and the IFI compare the fit of the initial model with that of an independent one. It is considered an indicator similar to the NFI index, although more consistent as it considers the degrees of freedom of the model. The values yielded by this indicator are between 0 and 1, with values above 0.90 being considered acceptable (Shumacker & Lomax, 2010). In our model, IFI is 0.906, which shows a good fit for the model.

- The non-normed fit index (NNFI) (this is the Tucker-Lewis index or TLI) compares the hypothesised model with the null model and works more efficiently with small samples and simpler models than the NFI. NNFI corrects the complexity of the model, since it penalizes the factors that contribute minimally to the improved model fit (Byrne, 2012b). However, since it is non-normed, it can have values higher than 1, making interpretation difficult (Teo, 2011). Like other incremental fit indices, a value higher than 0.90 indicates a good fit (McDonald & Ho, 2002). Unfortunately, in our model the NNFI is 0.898, which is a bad fit.

- The comparative fit index (CFI) is an additional development of NFI based on the sample size (Byrne, 1998). It evaluates the model's fit by comparing the χ2 of the model with the χ2 of the null model, whose value is between 0 (worst-case) and 1 (best case). CFI is the

least common of the incremental fit indices. It shows a good fit when its value is higher than 0.90 (Gefen *et al.*, 2011), or even 0.95 (Hu & Bentler, 1999). In our model, the CFI value is 0.905, which indicates a good fit.

The IFI and the CFI are good fits, and the TLI and the NFI show a bad fit. In section 4.6.5 we fix these two bad fits by adjusting the calculations of the error terms.

4.6.4. Analysis of parsimonious fit indices

The estimation of complex models is affected at some point in the calculation of absolute fit indices and incremental fit indices and, paradoxically, the simplest and more rigorous models might yield worse fit values (Mulaik *et al.*, 1989).

Mulaik *et al.* (1989) introduced parsimonious fit indices and considered the degree of freedom (*df*) in calculating the indices. The parsimonious fit indices introduce adjustments that favour parsimony (i.e., penalize complexity), for which simpler theoretical models are preferred over more complex theoretical models. For this reason, the greater the complexity of the model, the worse the performance of the parsimonious fit index will be. Three are the most important parsimonious fit indices: the PNFI, the PGFI and the PCFI, and they correct the loss of *df*. The PNFI is based on NFI, PGFI is based on GFI and PCFI is based on CFI.

However, there is a debate about the relationship between absolute and incremental fit indices with parsimony indices. The performance of the goodness-of-fit indices does not match that of parsimonious-fit indices. The cut-off limit for goodness-of-fit indices is 0.90, while parsimonious normed-fit indices are above 0.50. In addition, we evaluate the fit of our model regardless of parsimony considerations. Bearing this in mind, we will not rule out models with more parameters, but we prefer a simpler model. The parsimonious indices of the model exceed the cut-off limit of 0.50: PGFI = 0.729, PNFI = 0.781, and PCFI = 0.845. This shows that our model is very suitable and has a good fit.

4.6.5. Calculations of *e* and *R* in the model

The analysis has put into question the AGFI, NFI and TLI parameters of the model. We adjust the calculations of *e* (error term of item) and *R* (error term of first order construct) of the structural part of the conceptual model to fix this issue. SPSS Amos version 25 yields a type of information that can help to detect model misspecification: the modification indices (MI). An MI is conceptualised as a χ2 statistic with one degree of freedom*: 'the value of which represents the expected drop in overall χ2 value if the parameter were to be freely estimated in a subsequent run…MIs…are presented first for possible covariances, followed by those for the regression weights'* (Byrne, 2010:86-89).

Table 24 shows the modification indices (Jöreskog & Sörbom, 1982) for the measurement model related to the covariance of a pair of measurement errors or residuals. We show pairs of modification indices (MI) greater than 15 which have theoretical significance (Brown, 2015). Thus, a justification is needed: to add correlated errors between some indicators of the constructs, we ensure that these correlations are consistent with the rule we apply and are justified in our conceptual model (Brown, 2015), such as in the theory of planned behaviour.

Table 24. The modification *e* and *R* indices

Index*		Index*	M.I.	Per change	
*R*17 (ACN*i*)	↔	*R*18 (PBC*i*)	48.512	0.669	Correlation between residuals
*e*68 (ACN2)	↔	*e*72 (PBC2)	34.074	0.656	Correlation between measurement errors
*e*13 (HE3)	↔	*e*14 (HE4)	38.039	0.426	Correlation between measurement errors

*Symbol *e* represents the measurement error and *R* represents the residual of a component.

There are several reasons for these correlated errors. For example, it might be shared method variance due to different wording compared to other indicators in items ACN2 and PBC2 (see Table 19 for the complete list). Another reason relies on specific item content that was developed as a priori assumption in our conceptual model between active control (ACN*i*) and perceived behavioural control (PBC*i*) or in helping (HE*i*). The fit indices for the modification *e* and *R* indices of the final structural model are shown in Table 25.

Table 25. Fit indices for the 'final model'

Fit index	Value	Recommended cut-off values	Conclusion
Absolute fit measures			
χ^2	1861.270	The lower the better	
d.f.	921		
p-value	0.000	> 0.05 not significant	
χ^2/d.f.	2.021	< 5	Good fit
GFI	0.829	> 0.80	Good fit
AGFI	0.808	> 0.80	Good fit
SRMR	0.063	< 0.08	Good fit
RMSEA	0.050	< 0.08	Good fit
Incremental fit measures			
NFI	0.848	> 0.90	Bad fit*
IFI	0.917	> 0.90	Good fit

Fit index	Value	Recommended cut-off values	Conclusion
TLI	0.910	> 0.90	Good fit
CFI	0.916	> 0.90	Good fit
Parsimonious fit measures			
PGFI	0.737	> 0.50	Good fit
PNFI	0.789	> 0.50	Good fit
PCFI	0.853	> 0.50	Good fit

*NFI is sensitive in complex second order models with a large number of items (Hu & Bentler, 1998). NFI is also sensitive to sample size (Bearden, Sharma, & Teel, 1982), and a larger sample size should provide a higher NFI index (Elloumi, Iliopoulos, Wang, & Zomaya, 2015; Yadama & Pandey, 1995).

All fit indices are good except for the NFI index. Bearden *et al.* (1982) argued that NFI in a larger sample size provides better NFI indices due to a positive relationship between the sample size and the size of the goodness of fit adjustment index for Type 1 incremental adjustment index (Hu & Bentler, 1998); in turn, this is due to a positive relationship between the mean of NFI and the mean of sample size (Hu & Bentler, 1998). Therefore, we will report IFI instead of NFI as IFI considers the degrees of freedom of the model (see Table 22).

4.6.6. Hypothesised relationships

We proceeded to analyse the parameters, the significance of the estimation of the coefficients, and their implication in validating the formulated hypotheses (see Table 26). Finally, we estimated the fit of our final model using the proposed measurements shown in Figure 15 (Hooper, Coughlan, & Mullen, 2008).

While the fit showed the validity of the model (see Table 25), the validity of the theoretically proposed (hypothesised) relationships between the constructs was demonstrated by the analyses of the parameter estimates (see Table 26). This is calculated based on the degree of compatibility of the hypothesised relationships with the variance-covariance of the data (Schumacker & Lomax, 2010). We examined the calculated indices (Schreiber *et al.*, 2006) that show the regression weight and the significance of each hypothesised relation. This results in all kept hypotheses having *p*-values greater than 0.05, so all kept hypotheses must be accepted (see Table 26).

Table 26. Hypotheses and structural model path coefficients for the 'final model'

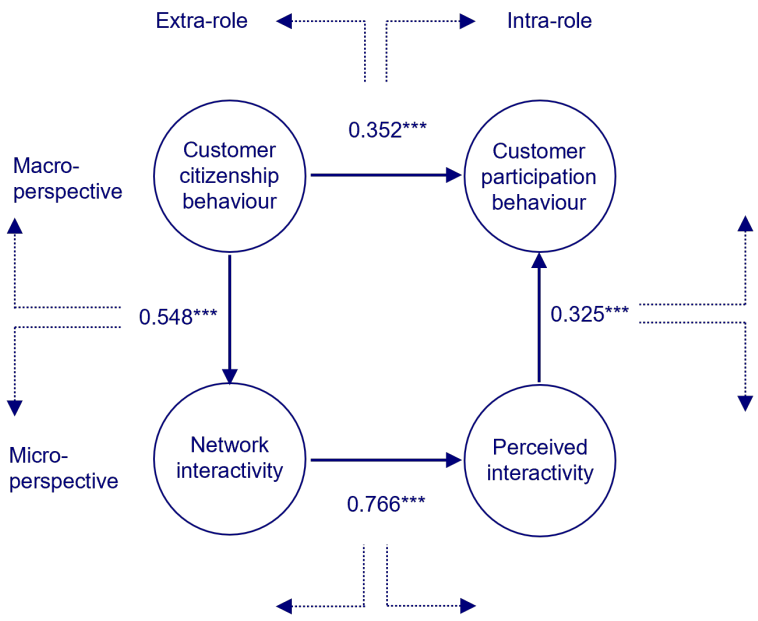
Hypotheses	Pathways	*β*	SE	CR	*p*-value
H1 (+)	CCB → NI	0.548	0.050	10.989	***
H2 (+)	NI → PI	0.766	0.089	8.608	***
H3 (+)	PI → CPB	0.325	0.060	5.379	***
H4 (+)	CCB → CPB	0.352	0.083	4.258	***

Legend: (+) significant; β: estimates; SE: standard error of the regression weight; CR: critical ratio value for regression weight; *** = 0.000.

Therefore, all our four hypotheses are supported by our empirical research (see Figure 16). According to these results, the following assertions can be made:

- Customer citizenship behaviour has a positive and significant impact on network interactivity (H1; β = 0.548, *p* = 0.000).
- Network interactivity has a positive and significant impact on perceived interactivity (H2; β = 0.766, *p* = 0.000).
- Perceived interactivity positively influences customer participation behaviour (H3; β = 0.325, *p* = 0.000).
- Customer citizenship behaviour has a positive impact on customer participation behaviour (H4; β = 0.352, *p* = 0.000).

Figure 16. The final model of value co-creation in Instagram with significant standardised path coefficients



Legend: *** *p* < 0.001.

In SEM, the coefficient of determination denoted by R^2 indicates the percentage of the variance of a dependent variable that is explained by its independent variable(s). Our results indicate that 60.30% of the performance in customer participation behaviour can be explained by customer citizenship behaviour, network interactivity and perceived interactivity. Furthermore, 58.80% of the perceived interactivity can be described using network interactivity and customer citizenship behaviour; and 65.80% of the network interactivity might be explicated using customer citizenship behaviour.

Chapter 5. Conclusions

The final chapter of this thesis dissertation consists of an executive summary that also presents the originality and innovation of our research, the main discussion and findings, our reflections about the main contribution to the research in the field of digital marketing, some key managerial implications, the most relevant limitations of the study and a set of venues for future research.

5.1. Executive summary, originality and innovation of the research

In Western societies, the production model has shifted from a goods-dominant logic to a service-dominant logic, due to the emergence of the internet and social networking sites (SNSs) and the increase in the use of mobile technologies and the introduction of the internet of things in everyday life. Immersive environments have become ubiquitous and have rapidly evolved into interactive platforms for value co-creation. We propose a holistic theoretical framework, that uses structuration theory to study value generation by users of hedonic SNSs like Instagram, through resource integration. The service-dominant logic frames our research problem regarding how value is co-created when customers integrate their personal operant resources (skills, knowledge and relationships) during unplanned and voluntary interactions with other customers in engagement platforms.

This doctoral research offers a holistic view of the elements that contribute to value co-creation by customers within the focal context of Instagram. We conceive that customer behaviour online is dual in nature, with extra and intra roles, and that instagrammers possess features of both customers (macro) and computer (micro) users. More particularly, this study shows that instagrammers' increased advocacy levels during the unplanned and voluntary usage of this SNS trigger value co-creation, not only directly but also mediated by interactivity. In addition, it reveals that interactivity manifests through network interactivity and individual perceived interactivity and that the former precedes the latter.

We seek to fill the gaps in the extant literature about the underlying mechanisms that lead customers to interact with other customers during experiences of value co-creation, and how the integration of operant resources drives value co-creation behaviour in Instagram. Also, we seek to answer the calls for research to advance the service-dominant logic (Vargo & Lusch, 2017; Wilden, Akaka, Karpen, & Hohberger, 2017).

We do so by developing a theoretical framework that conceives actor engagement as a microfoundation of value co-creation in service ecosystems. Consistent with the microfoundation movement approach, we build a conceptual model that unpacks the abstract macro concept of value co-creation by considering the interactions of actors at the individual level, the potential connections between macro constructs and the mediating role of micro-interactions.

This microfoundational approach has led us to offer a multi-level explanation of value co-creation that falls into the Coleman bathtub framework (1990). Consistently with this, our conceptual model considers: (1) the extra-role of the macro-level factor of customer citizenship behaviour; (2) the extra-role of the micro-level factor of network interactivity; (3) the intra-role of the micro-level factor of perceived interactivity; and (4) the intra-role of the macro-level factor of customer participation behaviour.

The four key components of our conceptual model (customer citizenship behaviour, network interactivity, perceived interactivity and customer participation behaviour) are integrated coherently under a service-dominant logic. The model also considers the specificities of a hedonic SNS like Instagram. Overall, this model is built upon a clear conceptual delimitation of: (1) a service ecosystem; (2) the process of resource integration leading to customer value co-creation; and (3) the roles that actors play in the social mechanisms that operate during social interaction – as co-creators and final definers of value.

At the macro-level, our conceptual model captures customer value co-creation behaviour leading to generic patterns of resource integration of social capital (Yi & Gong, 2013) during the unplanned and voluntary usage of Instagram. At the micro-level, the model depicts the varying effects of the sociological and psychological dimensions of interactivity in Instagram (Rafaeli, 1988; Rafaeli & Sudweeks, 1997; Steuer, 1992).

More specifically, the model suggests causal paths from customer citizenship behaviour to network interactivity (*H1*) and customer participation behaviour (*H4*), as well as a mediating role of perceived interactivity between network interactivity and customer participation behaviour (*H2*, *H3*).

We use a CB-SEM methodological approach to empirically test the hypothesised connections between constructs in our structural model. The analysis of the statistical results allowed us to validate the direct, indirect and total effects between the latent variables in the model:

a) A direct effect of the exogenous variable instagrammers' increased advocacy levels, conceived as customer citizenship behaviour, on the endogenous variable of customer participation behaviour (*H4*).

b) An indirect effect of the exogenous variable on the endogenous variable related to customer participation behaviour through mediating variables. Customer citizenship behaviour has an indirect effect on customer participation behaviour through network interactivity and perceived interactivity (*H1*, *H2,* and *H3*).

c) A total effect of customer citizenship behaviour, defined as the addition of its direct and indirect effects, on customer participation behaviour. There are direct effects of customer citizenship behaviour on network interactivity, direct effects of network interactivity on perceived interactivity and direct effects of perceived interactivity on customer participation behaviour.

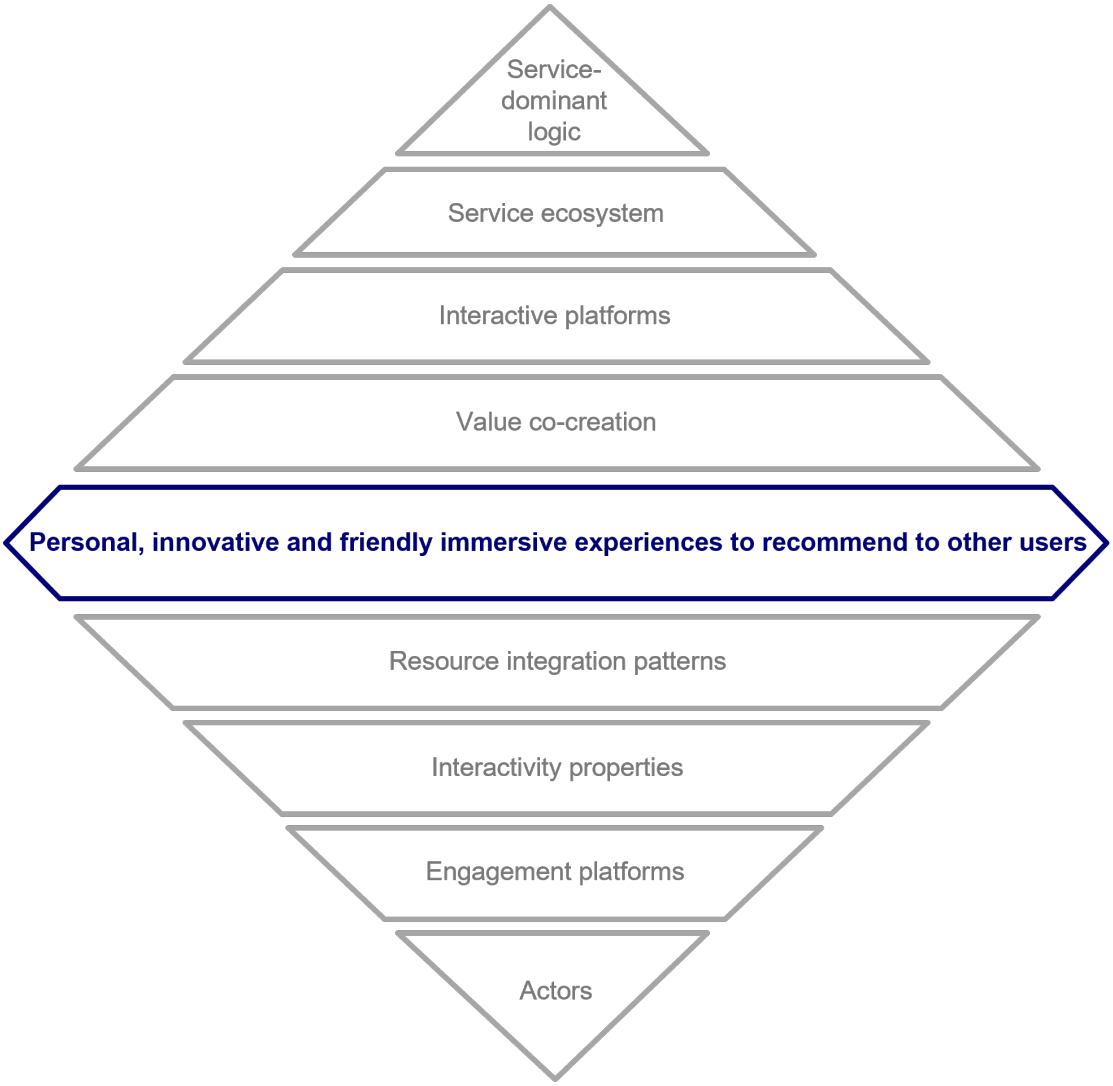
The results of our empirical test confirm all the proposed hypotheses (*H1* to *H4*). This not only validates our hypotheses, but also provides evidence that supports the theoretical accounts on which the hypotheses were founded. In addition, it verifies the adequacy of the measurement model: the reliability, convergent validity, and discriminant validity of all measurement items and their successful representation of each construct. The hierarchical CFA has provided highly accurate results. It is worth mentioning that for interactivity, which is splitted into two different constructs, the hierarchical CFA naturally separated the measurement items into two groups and confirmed the aggregation of the items around their corresponding constructs.

At the theoretical level, we participate in the academic conversation about how customer value co-creation behaviour (Meynhardt *et al*., 2016), under the service-dominant logic (Damkuviene, Tijunaitiene, Petukiene, & Bersenaite, 2012; Galvagno & Dalli, 2014; Gronroos & Voima, 2013),

leads to the diffusion of innovations (Vargo *et al.*, 2020). Our research broadens and deepens the understanding of customer value co-creation behaviour from the perspective of the customer and his or her perception of interactivity in Instagram. We do so by theoretically connecting interactivity with customer value co-creation behaviour (Yi & Gong, 2013). Also, we provide robust evidence about the relationship between value co-creation and interactivity (e.g., macro and micro levels) amongst actors during the integration of operant resources in service ecosystems.

In line with this, we propose that unplanned and voluntary interactive experiences with increased advocacy levels – i.e., personal, innovative and friendly immersive experiences that users can recommend to other peer users – facilitate resource integration of operant resources that lead to value co-creation in hedonic SNSs like Instagram (see Diagram 12).

Diagram 12. Linking value co-creation and interactivity through resource integration patterns



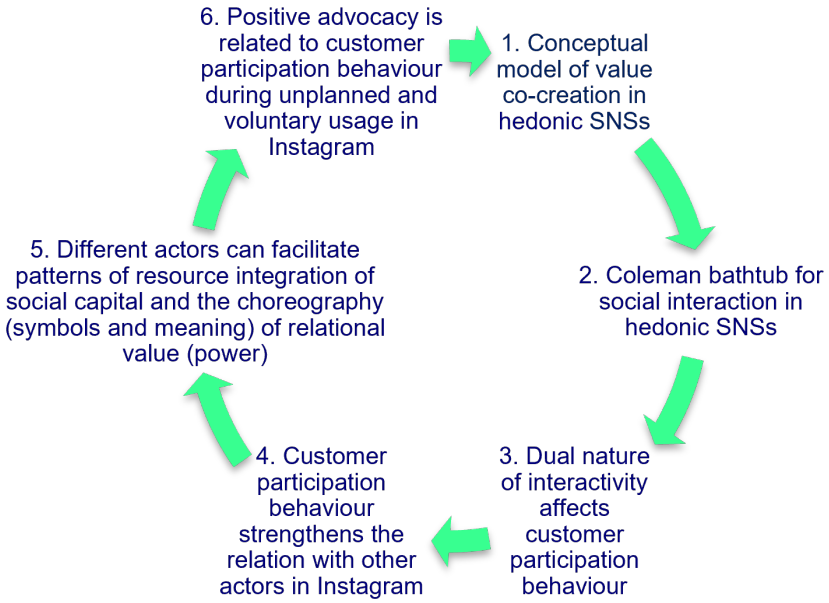
5.2. Discussion and findings

Our study offers a new conceptual model of value co-creation in hedonic SNSs, and it validates an adaptation of the Coleman bathtub to social interaction in Instagram. Few papers have studied

empirically interactive platforms for value co-creation in the focal context of a service ecosystem under service-dominant logic.

Furthermore, it empirically shows, for the studied sample of instagrammers, the dual nature of interactivity, both networked and perceived; how customer participation behaviour relates to customer relationships with other instagramers[60]; the resource integration patterns of social capital and the choreography of relational value; as well as the positive impact of increased advocacy levels on customer participation behaviour during the unplanned and voluntary usage of Instagram (see Figure 17).

Figure 17. Summary of insights and takeaways of this study



First, our review of the extant literature on value co-creation showed that value co-creation is an elusive concept that encompasses a wide range of human abilities and institutional capabilities (Vargo, Wieland, & Akaka, 2015). For this reason, our theoretical framework focused on the novel service-dominant logic (Vargo & Lusch, 2004; 2008b), whereby value arises from the interaction amongst actors during service-for-service exchanges.

We developed and validated a conceptual model of customers' immersive experiences of value co-creation (Payne *et al*., 2008; Ramaswamy, Ozcan & Writer, 2014) in Instagram. In our model, customer value co-creation behaviour results from the effect of customer citizenship behaviour on customer participation behaviour (Yi & Gong, 2013), during the unplanned and voluntary use of Instagram, and it is mediated by actor's interactivity (Rafaeli, 1988; Rafaeli & Sudweeks, 1997; Steuer, 1992).

In line with the structuration theory (Giddens, 1984), we considered all the inter-roles (extra- and intra-roles) and inter-levels (macro- and micro-levels) of the social relations and practices – as the

[60] Customer participation behaviour can help organisations maintain their customer base and to achieve greater profitability levels (Ercsey, 2016). First, the costs of losing customers are very high. Second, the longer the relationship between organisations and customers, the greater the perceived value by customers (Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015).

interplay between the social structure and the agency of actors – in the integration of actor's operant resources during value co-creation activities (Laud *et al.*, 2015) in the hedonic SNS of Instagram. We then tested the model with a sample of instagrammers, which allowed us to support the model and validate all its hypothetical causal paths amongst the latent constructs (customer citizenship behaviour, network interactivity, perceived interactivity and customer participation behaviour) for the sample of instagrammers.

Second, we explored and explained social interaction as a critical component of value co-creation. The management and creation of value in companies require a unique capability: managers should be sensitive to customers' interaction with the network of users (Prahalad & Ramaswamy, 2004). This gap in knowledge poses a problem for academic research and business managers due to the extraordinary increase in social media usage.

Our research is the first to examine value co-creation using the Coleman bathtub, in which value co-creation is mediated by interactivity. Our study is connected to the predominant theory of social interaction for the creation of social capital (Coleman, 1990). We achieved this with the application of the Coleman bathtub, based on the micro-foundations movement, which in turn is based on the structuration theory (Giddens, 1984).

Third, our study expanded the understanding of the dual concept of interactivity, which operates in the network of users and the perception of the medium used. The study of the social and psychological factors of interactivity, in users of hedonic SNSs, is linked to the social mechanisms (action-formation mechanisms) that reside between the social aspects of the users' network and the users' individual perceptions about the use of the technology. Based on this, we connect the concept of network interactivity, which is shaped by the social aspects of interactivity, with the notion of perceived interactivity, which takes into consideration the psychological aspects of interactivity.

Our model stems from the rational choice theory devised by Coleman (1990) – who, in turn, extended the traditional rational choice models to social capital theory by considering social norms and organisations. Accordingly, we considered: (1) the integration of resources at the micro-level of relational governance; (2) how relational structures govern resources integration processes and outcomes; and (3) the fact that relational factors (such as recommendation, connectedness, two-way communication and information sharing) function adequately because of shared institutional logic. For example, the connectedness facet of network interactivity can have an impact on the behavioural patterns of resource integration due to the effect of a network of actors on the self of the individual actor (Storbacka *et al.*, 2016)

Fourth, some scholars argued that customer participation behaviour in value creation is a new source of competitive advantage, a means to generate greater customer trust (operationalised as responsible behaviour) in a network and a way to create meaningful relationships amongst customers (Firat & Venkatesh, 1993; Prahalad & Ramaswamy, 2004; Vargo, 2008; Vargo & Lusch, 2004b; Vargo, Maglio, & Akaka, 2008b; Blasco-Arcas, Hernández-Ortega, & Jiménez-Martínez, 2013). We can add the importance of information sharing and personal intention in customer participation behaviour during value co-creation.

Fifth, from a theoretical object-oriented perspective, we argued that resource integration is dual in nature (interaction and emergence) (Peters & Pressey, 2009). This mirrors our dual concept of

interactivity: network interactivity (interaction) and perceived interactivity (emergence) in our research:

- There is a number of specific activities based on interactions amongst actors, in which we can measure input and output (Peters *et al.*, 2014). Resource integration as social interaction, summative or designed (Ballantyne & Varey, 2006; Fyrberg & Juriado, 2009) implies that goods become resources, when integrated by a series of interaction-based dynamic activities. There is a link between interaction-based dynamics and value: the value of integrated resources is linked to the nature, quantity and perceived quality of their corresponding interactions.

- There is an emergent process of new depositional properties, which are most likely observable and measurable at the micro-level. Resource integration as emergence (Clayton & Davies, 2006) implies that new properties arise from the actor's internal attributes within the interaction with resources: the value of integrated resources is linked to the emergent characteristics of these resources.

We found in our study sample that resource integration patterns of social capital and the choreography (symbols and meaning) of relational value are facilitated by several factors: (a) unsolicited feedback, defence, helping, and recommendation, which all define the second order construct of customer citizenship behaviour; (b) perceived personalisation, playfulness, connectedness and responsiveness, which made up the extra-role and micro-level construct of network interactivity; (c) two-way communication, control-ease of use, active control, perceived behavioural control and synchronicity, which are constituent constructs of the intra-role and micro-level higher-order construct of perceived interactivity; and (d) information sharing, responsible behaviour and personal intention, which delineate the intra-role and macro-level construct of customer participation behaviour. Also, we found, for the sample of the study, that solicited feedback and tolerance are not constituent constructs of the second order construct of customer citizenship behaviour, and information seeking in the second order construct of customer participation behaviour do not facilitate resource integration patterns of social capital and the choreography of relational value, due to their low effect on social influence.

Different actors can facilitate innovative resource integration patterns of social capital and the choreography of relational value. For example, Instagram can reinforce factors affecting macro-constructs, such as unsolicited feedback, defence, helping, recommendation, information sharing, responsible behaviour and personal intention in macro-level associations of rules and tools. Users' groups can expedite factors affecting micro- perspective constructs, such as perceived personalisation, playfulness, connectedness, responsiveness, two-way communication, control-ease of use, active control, perceived behavioural control and synchronicity during action-formation mechanisms of resource integration. Brands and firms can accelerate factors affecting extra-role constructs, such as unsolicited feedback, defence, helping recommendation, perceived personalisation, playfulness, connectedness and responsiveness during situational mechanisms of resource integration. Finally, instagrammers can trigger factors affecting intra-role constructs, such as two-way communication, control-ease of use, active control, perceived behavioural control, synchronicity, information sharing, responsible behaviour and personal intention during transformational mechanisms of resource integration.

Sixth, to understand the role that increased advocacy levels play in customer citizenship behaviour during unplanned and voluntary usage, creating collective positive behavioural traits, our research adopted a micro-level perspective in the study of stakeholder interactions in engagement platforms

to support the macro-level perspective of customer value co-creation behaviour. We found that increased advocacy levels in customer citizenship behaviour, during unplanned and voluntary usage of Instagram, are positively related to customer participation behaviour, especially with regards to responsible behaviour. Also, relational value (power) and the *choreography* (symbols and meaning) of spatial-temporal conditions are related to increased advocacy levels (Kwon, 2015).

5.3. Contributions to the research in the field of digital marketing

Our study contributes to the research in the area of digital marketing in seven important ways.

First, it helps to better understand how, and to what extent, customer citizenship behaviour affects customer participation behaviour, during value co-creation activities, in the configuration of hedonic SNSs. By configuration, we mean the nodes and dyadic links that facilitate the creation of interactive platforms and service ecosystems under the service-dominant logic. Although there are studies on value co-creation, such as the seminal work of Yi & Gong (2011), our research is the first to examine how service ecosystems and interactive platforms affect the design and configuration of hedonic SNSs Instagram, under the service-dominant logic. In addition, our study goes one step further and links the service-dominant logic with the structuration theory of Giddens (1984).

Second, our research sheds more light on how interactivity mediates the effect of customer citizenship behaviour on customer participation behaviour in the hedonic SNS of Instagram. This is the first holistic study on the factors that boost value co-creation that considers the two different conceptions of interactivity suggested by Rafaeli (1988) and Steuer (1992). Furthermore, it reveals three direct relationships never seen before: (1) the role of customer citizenship behaviour as an antecedent of network interactivity; (2) the positive effect of network interactivity on perceived interactivity; and (3) the role that perceived interactivity plays as an antecedent of customer participation behaviour.

Third, our empirical study has validated a taxonomy of resource integration of operant resources in Instagram. Based on the existing literature, we have formulated the hypotheses of the extra and intra roles and macro and micro level relationships between constructs based on the social mechanisms – situational, action-formation and transformational – described by Coleman (1990) and shown as arrows 1, 2 and 3 in Figure 12. In the academic debate on resource integration (Edvardsson *et al.*, 2014), our research is the first to empirically address the type of personal operant resources (skills, knowledge and relationships) that once integrated through a process involving customer participation behaviour (with dimensions information sharing, responsible behaviour and personal intention) and information networks of participant actors, leads to the creation of social capital.

Fourth, we offered evidence about the ability of information to seek the most suitable medium for its propagation in a service ecosystem by taking advantage of the dual nature of interactivity during value co-creation. This refers to the positive impact of network interactivity on perceived interactivity, which establishes the capacity of a medium to share users' feelings along with their social contacts, thus facilitating users' ability to feel at ease in the medium.

Fifth, our study highlights the importance of the actor's position in the network (recommendation) in creating (social capital) value. We studied the indirect influence of network interactivity on customer participation behaviour where value creation is linked to the actors' position in the network. Due to action-formation and transformational mechanisms, network interactivity leads to resource integration of operant resources. Since information follows an epidemic-type distribution, and its impact depends on the actors' position in the network due to social influence, we infer that the position of an active user of Instagram in a network elicits customer participation behaviour in value formation during resource integration of operant resources.

Put differently, this study shows that network interactivity – understood as the position of an actor within the network due to social influence – is linked to the formation of responsible behaviour in other actors. Furthermore, it reveals that perceived interactivity is linked to the formation of responsible behaviour in the medium (Wang, Meng, & Wang, 2013; Sharma, Menard, & Mutchler, 2019). More interestingly, customer citizenship behaviour affects customer participation behaviour and responsible behaviour, due to the capacity to retain its customer base (Revilla-Camacho *et al.*, 2015; Yi *et al.*, 2011).

Sixth, we have demonstrated that the unplanned and voluntary usage of Instagram in customer citizenship behaviour is a function of perceived interactivity, in which the user's control-ease of use facilitates the use of the communication medium. The less the medium requires that users learn how to operate it, the more likely the perception of the usage of hedonic SNSs will be unplanned and voluntary. The dimension of control-ease of use is studied as an intra-role at the micro-level of analysis of perceived interactivity.

Finally, defence and recommendation seem to follow different paths. On the one hand, defence is a supportive activity in customer citizenship behaviour and is linked to the creation of convincing and positive behavioural traits towards firms and businesses in the customer´s mind. On the other hand, recommendation is connected to social influence in customer citizenship behaviour, in which customers have become highly dependent on the recommendations and the help of other customers, often exceeding personal preferences. In the customer's mind, his or her closest circle of friends and family warns, through recommendations, against bad brands and companies. The reason for this is none other than connectedness in network interactivity: connectedness stimulates protection and confidence as long as playfulness and perceived personalisation are involved in the process. However, connectedness coupled with the presence of multiple devices brings distractions. Consumers' ability to concentrate is hampered and often limits their ability to decide. Therefore, many customers make their decisions following the wisdom of the crowd, as recommendation demonstrates.

5.4. Managerial implications

Value is the core of service ecosystems. The service-dominant logic perspective places value at the centre of service ecosystems and the integration of resources by stakeholders. We define a set of propositions depicting the application of an organisation's service-dominant logic on the basic components of its business model. Brands and firms need to strategically plan their interaction with customers based on: (1) resource integration patterns of social capital; (2) interactivity properties; (3) engagement platforms; and (4) actors.

Bearing this, the business model of firms (content, structure and governance) should enhance new business capabilities in social e-commerce (Lin, Li, & Wang, 2017) that focus on transactions in

hedonic SNSs like Instagram, and facilitate the generation of value-in-use and value-in-context by customers.

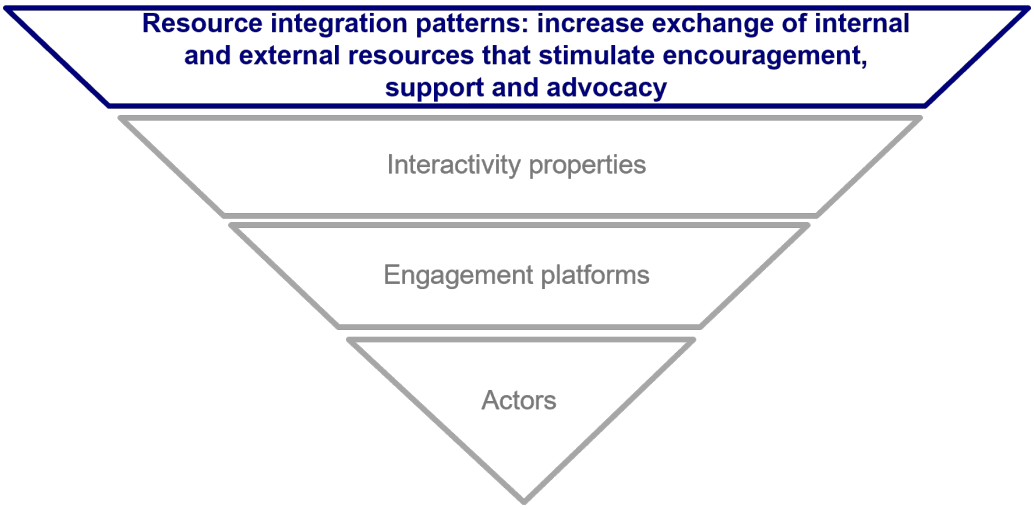
5.4.1. To facilitate the exchange of operant resources to generate more value

Our service-dominant logic theoretical framework can assist companies and brands in enabling the exchange of operant resources embedded in service ecosystems to jointly co-create value amongst stakeholders. For example, during transactions, brands and firms interact with customers through the mutual exchange of operant resources (skills, knowledge, and relationships), leading to new resource integration patterns of social capital. Similarly, regulators, consumer agencies and public authorities can use our service-dominant logic theoretical framework to evaluate the efficiency and effectiveness of companies and brands in co-creating value epitomised in generic resource integration patterns of social capital.

New business capabilities (Shanks, Gloet, Someh, Frampton, & Tamm, 2018) that focus on services in hedonic SNSs, such as Instagram, can be a fundamental source of competitive advantage for the brands and firms, its network of partners and its customers. The digital marketing strategy of companies and brands, which seek to gain a sustainable advantage through planned thinking and practice, can benefit from the exchange of operant resources at the micro-level of C2C interactions. Through these digital marketing strategies, brands seek to improve the overall size of customer networks, insofar as this provides a broader basis to acquire resources externally; and increase advocacy levels of brands (Ballantyne & Varey, 2006).

The integration of internal and external resources requires tractability and efficiency of the transaction structure (in the context) of the exchange of *'like for like'* services. Therefore, companies and brands can facilitate customer value co-creation behaviour based on: (1) the type of resources that actors integrate to enhance existing services, or develop new ones (Kutsikos, 2009); and (2) the type of co-creation that is manifested in the service ecosystem through service offers. These resources can vary from the existing basic resources that belong to the service ecosystem, to new *'knowledge capability'* (Kutsikos, 2009:1), which are resources assimilated or co-produced with other service systems (Grotherr *et al.*, 2018) (see Diagram 13).

Diagram 13. Resource integration patterns



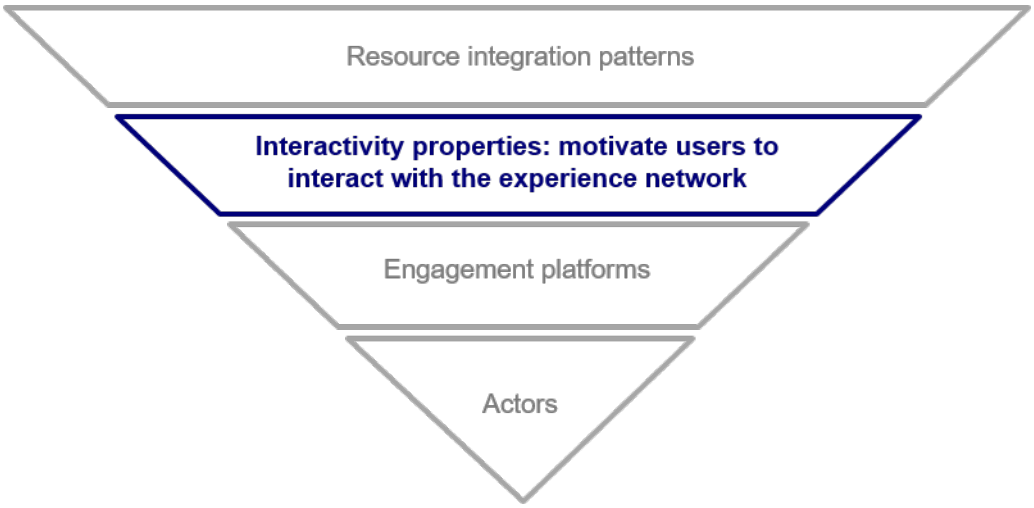
5.4.2. To motivate users to interact with their experience network

If users can choose between doing business with an anonymous system and with a person, they would choose a person, and preferably of their trust. Thus, the great advantage that Instagram offers to brands is approaching their customers in a more human way, since all the elements necessary to establish an individual conversation with the customer are available on the platform.

Instagram is a tool that allows brands to listen to the customer, instead of solely sending messages to them. In addition, the platform does not only allow a brand to communicate as if it were a single user, but rather it can manage communities of users, e.g., the fan-page of a brand, and its relevance to such communities. Therefore, Instagram can benefit brands by improving their interaction with users, increasing their advocacy levels, and achieving marketing and business goals.

Notwithstanding, members of experience networks must be motivated to actively participate and exchange operant resources, such as skills, knowledge and relationships. Under a service-dominant logic, business models must develop informal mechanisms of governance that involve trust and the mutual benefit of actors. User's operant resources are very often personal and, therefore, require an adaptation to the context of the service network, since formal governance mechanisms might hinder the exchange of operant resources with their experience network (see Diagram 14).

Diagram 14. Interactivity properties



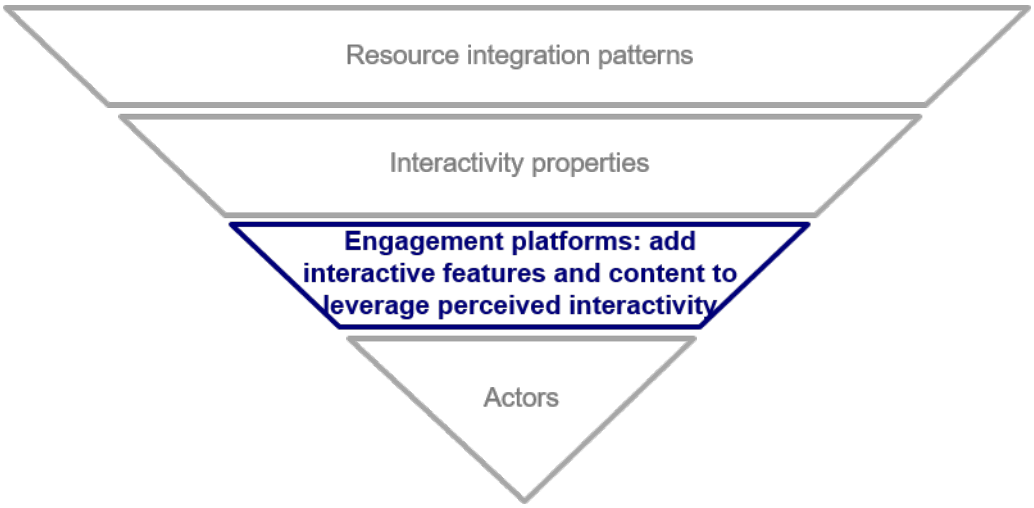
5.4.3. To add interactive features and interactive content

Service designers must develop service platform (delivery systems) functionalities (Bidar, Watson, & Barros, 2016) that meet the objectives of: (1) providing users with information, either actor-to-actor or actor-to-firm; and (2) developing easy-to-navigate and user-friendly interfaces and entertainment activities that enable brand knowledge, socialisation and hedonic benefits (Vink, Koskela-Huotari, Tronvoll, Edvardsson, & Wetter-Edman, 2020; Windahl & Wetter-Edman, 2018). These functionalities[61], aimed at improving a sense of empowerment in users, result in a greater commitment of the community of users through the generation of feelings of joy, user's actual control and freedom of choice.

In addition, interactive content on Instagram stimulates perceived interactivity, which is a powerful marketing means because it helps to integrate customer's operant resources in order to act on operand resources (and other operant resources). Therefore, managers and marketing specialists should consider adding more interactive technology-enhanced content by users, in order to facilitate the integration of stakeholder resources. This is because creating more resources is a compelling advantage for businesses, and it can be improved with technology and marketing tools (e.g. evaluations, personalisation tools, games and other participatory features) (see Diagram 15).

[61] There are six interactive functions that significantly affect the perception of interactivity of a website (Voorveld, Neijens, & Smit, 2011). These are: recommending the website to a friend, a feedback form, a product that can be registered online, drop-down menus, the ability to customise products and website customisation. For example, perceived personalisation increases the feeling of ownership, as reflected in the expression: it is mine! By doing so, personalisation eliminates the barriers that hinder the interaction of the users with the environment and with other users, precisely because it generates gratifying and satisfying sensations, a more positive attitude, and a greater firmness and predisposition.

Diagram 15. Engagement platforms



5.4.4. To segment markets according to customer value co-creation behaviour and advocacy practices

Segmentation involves determining a target audience: the brand fan page is open, and users of all kinds can be part of the brand community, so the brand must be clear and target specific segments.

Once brands have segmented their target audience, based on increased advocacy levels and customer value co-creation behaviour, they can target these groups with customer-focused marketing material. An electronic customer relationship management (e-CRM) system helps streamline this process so that the brand can identify customers who are more receptive to specific goods and services[62].

If instagrammers with high levels of advocacy can be segmented according to well-defined personalities – i.e., individual differences or social group characteristics of user's profiles that respond to a particular message – the likelihood that a specific marketing campaign succeeds is greater. Also, the possibility of a campaign to succeed is higher if we move from the transition phase to the ripple phase, in which followers of instagrammers with high levels of advocacy are aware of the brand message. The community of each follower might then spread his or her brand message, creating brand awareness and the ripple effect of promotional messages in his or her community.

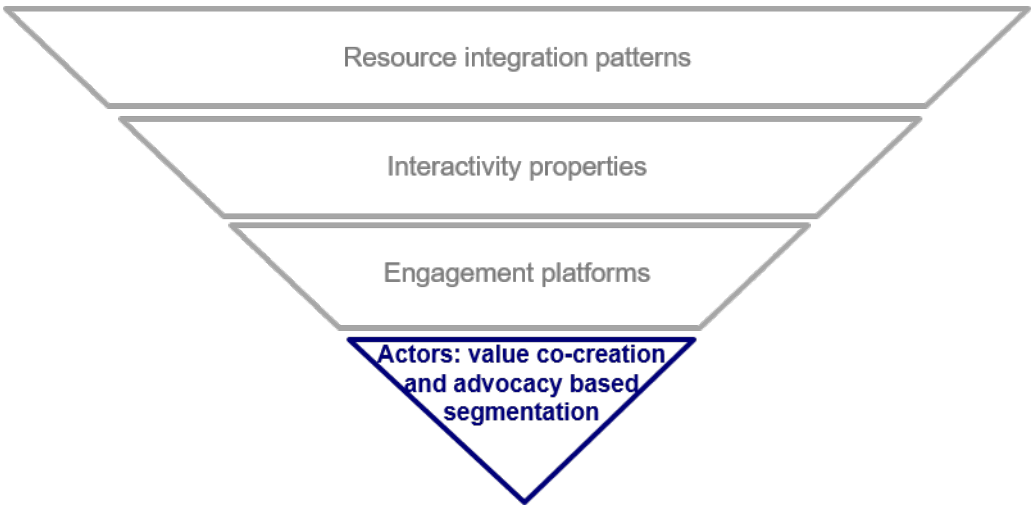
We encourage business managers to use Yi & Gong's (2013) customer value co-creation behaviour scale[63] for market segmentation and customer profiling value propositions by evaluating

[62] Instagram does not only allow to segment the audience demographically, but it can also identify users' preferences in different informational, relational, and motivational categories, currently and projected for the future. It is necessary that each brand precisely identifies what audience it intends to target, demographically and by a set of preferences or different personalities (Nedkovski & Guerci, 2021). As each user designs their profile according to their own preferences, Instagram can use it to segment by different categories. In general, the benefit of Instagram is that users' preferences can be identified and measured; this can generate added value for brands and their type/style of communication to users.

[63] The customer value co-creation behaviour scale we propose in this research is consistent, reliable and nomologically valid. This scale can help brand managers to understand how customers can contribute to a firm's brand value. Managers

and rewarding the increased customer interaction with the brand. Rather than segmenting markets based purely on customers' demographic characteristics, consumption behaviour, attitudes, or what is important to them, we recommend considering also users' progress in generating ideas for brands (see Diagram 16).

Diagram 16. Actors



5.4.5. To adopt a holistic view of services on the internet of services

The internet of services[64] is a new domain for social e-commerce (Pappas *et al.*, 2019) that results from the integration of several service ecosystems through the internet of things (Reis & Gonçalves, 2018) and social media technologies. It facilitates interaction amongst customers across different interactive platforms. The internet of services, in which service ecosystems powered by social media technologies can be vastly improved, can help customers to boost interactivity with other customers to co-create added value (Kutsikos, 2009).

The value of the internet of services emerges from the big data analytics[65] of the multiple actors interacting in service ecosystems (Bresciani, Ciampi, Meli, & Ferraris, 2021; Saura, Ribeiro-

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can segment their markets based on the degree customers are inclined to co-create brand value. Managers can implement marketing campaigns aimed at clusters of customers with a higher willingness to interact with the brand. Also, managers can design specific marketing campaigns to engage more clusters of customers with a medium level of interest in the brand to increase users' willingness to interact with the brand. The outcome of customer value co-creation behaviour measurement scale can signal problematic areas within the company's co-creation efforts, so managers can allocate resources more efficiently. For example, managers can mobilise operant resources, like: (1) knowledge to educate stakeholders about the brand; and (2) skills to improve stakeholders' abilities. Managers can also help increase trust in the brand by multiplying the number of valued interactions with customers.

[64] We defend that co-creation and collaboration between the brand and customers occur when the organisation expands its spaces for interaction and dialogue with customers, such as SNSs, so the brand can listen to the discussions and evaluations made by customers (Smith & Zook, 2011). The growth in the provision of services to users of online communities has profound implications for businesses and firms, as evidenced by the rise of C2C service exchange applications; however, it is still little understood. The opportunities offered by shared business applications make a significant impact in service-oriented social networks (SOSNs), mainly through value-added behaviour.

[65] To help brands build new value propositions based on the data generated by customers' interactions (Angelopoulos *et al.*, 2021), brands need a new classification framework that formally represents the choreography (symbols and meaning) of the spatial-temporal conditions of actors in hedonic SNSs, like Instagram. As a result, more customer value is created:

Soriano, & Palacios-Marqués, 2021). For example, interactions amongst actors in social media generate customer data that serves as a benchmark to test current business methods and practices and offer excellent opportunities to envisage new business models (Rohn *et al.*, 2021).

The internet of services can allow brands to monitor collaboration amongst customers, control service delivery (Srivastava, 2021), optimise good and service offerings, and facilitate autonomy of service governance. Customer data generated by the internet of services can be analysed to obtain new insights into customer value co-creation behaviour. Customer data facilitate new and better customer relationships. Data can help brands :

- To create better customer profiling, which in turn facilitates better brand positioning and more effective communication strategies.
- To adopt new marketing strategies that enable brands to evolve their business models.
- To increase advocacy levels for brands and businesses at each of the touch-point of interactive platforms.

The internet of services technology increases the prospect of multiplying interactions between customers and newly co-created goods and services, generating new operant resources (skills, knowledge and relationships). The internet of services can help predict customer needs and provide brands with more complete and specific information about customers' profiling and segmentation. It facilitates connectivity by relating and integrating customers who recommend the brand to other customers and networks, leading to more personal, innovative, and friendly experiences. Therefore, the internet of services might not only have a profound effect on the development of new business models; it can help align business, social media, and marketing strategies to achieve better organisational performance, positively affecting new brand value propositions.

5.5. Ethical considerations

Our research design meets the professional ethical standards established in the *ICC/ESOMAR International Code on Market, Opinion and Social Research and Data Analytics*. We also followed UNESCO 33rd conference held in Paris, 3-21 October 2005 on the code of ethics *'the General Conference, A. under agenda III. 1-The Ethics of Science and philosophy Sub-programme III. 1.1-The Ethics of Science, page 76'* on research design (no harm), data collection (consent) and analysis (confidentiality and anonymity), and proceeded according to the current Spanish laws and regulations regarding personal data protection.

First, we ensured that participants were not to be harmed. Second, consent was requested from participants in the survey, which was prepared for academic purposes only. Third, only relevant information for the study was collected. Fourth, we ensured that the standards were maintained in the voluntary participation, and that anonymity and confidentiality were ensured during data collection and storage. Also, the data analysis was conducted thoroughly and with full compliance with the code of conduct for anonymity; reports with the study conclusions were sent to

(1) if users are motivated to interact with other users due to enhanced interactive features and content; and (2) whether it is facilitated by market segmentation according to customer value co-creation behaviour scale.

participants and any questions or concerns raised during the fieldwork were answered immediately. Fifth, special attention was given to avoid any potential bias and insensitivity regarding gender, culture and class differences.

5.6. Limitations of the study

The most important limitation in this doctoral research is that we could not carry out an ex-post analysis of the sample representativeness, so that the results obtained for the sample cannot be generalised to the entire population.

A second limitation stems from having used covariance-based SEM techniques, which, as any other statistical methods have their shortcomings. Since a latent variable is closer to a construct than a measured variable, it does not entirely represent the construct. This is because its variance is the sum of the true variance of the measured variables and the error between the measured variables.

Also, SEM cannot amend the deficiencies inherent to any study. However, the simultaneous exploration of multiple variables enabled by SEM can compensate for the difficulties of using a more extensive questionnaire – necessary for the analysis of additional variables. An analysis of the links between the variables and a previous specification can be statistically significant, diminishing its theoretical importance. Maintaining a constant number of cases and changing the observed relationship between variables – as in the case of varying the correlation between residuals and the correlation between measurement errors – significantly impact the statistical *p*-value. Therefore, we have been careful before extracting too much information at the risk of achieving wrong conclusions.

Third, since the scope of interactivity is broader than engagement, the complexity (type and number) of services in interactive platforms is greater than in engagement platforms. Although value co-creation is a core component of service-dominant logic (Lusch, Vargo, & Gustafsson, 2016), it is hard to confirm empirically its importance at the macro-level (Storbacka *et al.*, 2016). Storbacka *et al.* (2016) supported the research on engagement as a micro-foundation for value co-creation. Accordingly:

- We considered that actor engagement represents both the context for engagement and the process of engagement in an interactive process that leads to the integration of resources within a service ecosystem.

- We deemed that an interested party that participates as an engaged actor is a particular case of interactivity during the integration of resources within a service ecosystem.

Fourth, our dimensions of ‘customer citizenship behaviour’ do not necessarily coincide with those used in other studies, as we examine ‘customer citizenship behaviour’ in the service context, during unplanned and voluntary usage of hedonic SNSs. It was initially devised in political sciences to define civic life in an open society in western countries. Yi & Gong (2013) adapted the scales of ‘customer citizenship behaviour’ to the service context in their empirical study of voluntary customer value co-creation behaviour. In turn, we adapted the scales of ‘customer citizenship behaviour’ to the unplanned usage of hedonic SNSs. For this reason, we add the

dimensions of recommendation (Groth, 2005) and solicited feedback (Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Groth, 2005).

- Customer citizenship behaviour was initially seen from the perspective of education, community and involvement in politics and public life (Wilhelm, 2014). In this view, citizen behaviour is relevant for the production of systems of democratic life, and encourages social criticism, commitment, the search for equity, social justice, public responsibility, participation and citizen autonomy.

- Lately, the construct of customer citizenship behaviour has been adapted to the field of marketing to designate the role of customers – as actors that operate in the market dynamics – are increasingly empowered, critical, participatory, involved, and responsible for the co-creation of goods and services (Bove *et al*., 2009; Saren, Maclaran, Goulding, Elliott, & Shankar, 2007). This construct designates the behaviour of a customer who voluntarily contributes to acts of service in favour of other customers (Gong & Yi, 2019). Under service-dominant logic, customer citizenship behaviour is referred to as *'participation in the provision of services'*, and it is conceived as a state of interest, motivation or excitement (Encinas-Orozco & Cavazos-Arroyo, 2016:652). When participation is achieved, collaboration is disinterested, active and voluntary, and positively affects the actors involved and the organisation in general (Bove, Robertson, & Pervan, 2003; Yi & Gong, 2008).

- In this study, we consider customer citizenship behaviour as *unplanned* behaviour. Unplanned behaviour refers to the possibility of an individual to make unintended, immediate and unreflective service exchanges due to the recommendations received from other actors. For this reason, we considered the dimensions of recommendation (Groth, 2005) and solicited feedback (Revilla-Camacho, Vega-Vazquez, & Cossio-Silva, 2015; Groth, 2005).

Fifth, in earlier conceptualisations of perceived interactivity (Song & Zinkhan, 2008; Liu, 2003; McMillan & Hwang, 2002; Wu, 1999), actual control and perceived behavioural control (Leiner & Quiring, 2008) that were not taken into consideration as dimensions because the interaction between the user and the organisation was seen as planned and mandatory.

Steuer's (1992) perceived interactivity concept is based on the human-computer interaction paradigm, where the medium is visible to the user. User's interaction with other users is mediated by user-computer constructs such as flow and telepresence, and it is linked to mental imagery and imagination during planned and mandatory interaction with the business or firm. As a result, the definition of perceived interactivity in this study has been adapted to the research of the unplanned and voluntary usage of hedonic SNSs, like Instagram, by adding the dimensions of active control and perceived behavioural control.

Sixth, our operationalisation of 'defence' do not necessarily match with those used in other studies, because the precise meaning of 'defence' is often little known. Most studies of defence do not describe it completely, and they consider defence to be a self-evident concept. However, some nuances differentiate defence from related concepts like e-WOM, loyalty (Cossío-Silva, Revilla-Camacho, Vega-Vázquez, & Palacios-Florencio, 2016), customer satisfaction, reputation or intention to use.

Defence has to do with fervently praising a service to people, such as friends and relatives (Bettencourt, 1997). It implies disseminating positive e-WOM and it strengthens publicity, reputation and service promotion: *'notably, **(defence)** is strong, passionate, explicit, and ongoing, with an explicit goal of positively influencing others' views'* (Sweeney, Payne, Frow, & Liu, 2020:139); it also increases the ratings generated by service quality assessments and reinforces loyalty. Defence is voluntary in nature and is very useful for value co-creation (Walsh *et al.*, 2005).

Although we have considered defence and e-WOM as similar concepts, this assumption must be re-examined in future studies because even though e-WOM and defence are very similar (Bettencourt, 1997; Novak *et al*., 2000), they are not the same. E-WOM can be defined as an informal exchange of information on goods and services (Westbrook, 1987) that is aimed at customers and producers through social media technologies. Litvin, Goldsmith, & Pan (2006) defined e-WOM as a function of informal communication about goods or services amongst customers, or between customers and firms, through technological means. WOM promotes brand image, goods and services, as well as brand quality and loyalty (Bettencourt & Brown, 1997; Groth *et al.*, 2005). This definition brings e-WOM closer to defence, loyalty and intention to use with the only nuances of 'informal', 'usage of goods and services', and 'credibility'. Therefore, we differentiate the concept of e-WOM with what we consider for defence.

- In this study, the essence of defence may arise in its operationalisation which considers three aspects: (1) if the user will say positive things about Instagram and their followers to others; (2) if the user will recommend Instagram and the followers to others; and (3) if the user will encourage friends and relatives to use Instagram. This approach includes, both the positive behaviour and the 'intention to use' (Yi & Gong, 2013).

- We see defence as the materialisation of e-WOM (Gvili & Levy, 2018), and loyalty and intention to use as other concomitant manifestations of e-WOM. This significantly strengthens the association of defence and loyalty with e-WOM (Bettencourt, 1997), which is part of the third variable in the scale of defence used by Yi & Gong (2013).

5.7. Directions for future research

We identify six topics for future research: (1) the interplay between the potential third-order factors of value co-creation and actors' interactivity and the construct of customer satisfaction; (2) the potential mediating or moderating roles of continuance intention and loyalty in value co-creation processes; (3) the connection of perceived interactivity with social presence, flow and spatial presence; (4) the impact of resource integration processes, relational value and the *choreography* of the design of engagement platforms; (5) the physical interaction versus online interaction in relation to user's representation systems; and (6) the moderating role of perceived network size on the causal path from network interactivity to perceived interactivity.

First, we propose to relate the potential third-order constructs of value co-creation to the second-order constructs of customer citizenship behaviour and customer participation behaviour and connect the potential third-order constructs of actors' interactivity to the second order constructs of network interactivity and perceived interactivity. We have already studied the second order factor relationships between customer citizenship behaviour, customer participation behaviour, network interactivity and perceived interactivity, with increased levels of advocacy, during the unplanned and voluntary usage on the hedonic SNSs of Instagram.

In addition, we suggest studying the link between customer satisfaction and value co-creation in our model, since customers could experience a direct relationship between value co-creation behaviour and satisfaction with the service (Vega-Vazquez, Revilla-Camacho, & Cossío-Silva, 2013). Likewise, we propose to examine the link between customer satisfaction and interactivity in our model (Shipps, 2013).

Second, we propose to extend our conceptual model to study the potential mediating or moderating roles of continuance intention (Rodríguez-Ardura & Meseguer-Artola, 2016c) and loyalty (Doral-Fábregas *et al.*, 2018) in the creation of positive attitudes towards the brand and the website. Multi-disciplinary studies have provided foundational support for the phenomena that links the experience of interactivity (Rafaeli, 1988; Steuer, 1992) and value co-creation (Prahalad & Ramaswamy, 2004b; Vargo, Maglio, & Archpru, 2008) in SNSs and in other digital media products that offer hedonic experiences (Bente & Krämer, 2002; Pinho, Beirão, Patrício, & Fisk, 2014). In fact, perceived interactivity is directly related to the actor's behaviour in digital technologies and is connected with continuance intention. There are indications of a positive effect of perceived interactivity, on attitude and memory, when users have immersive experiences in digital media (Chung & Zhao, 2004).

Similarly, perceived interactivity is linked to attitudes and predicted behavioural intention when users play advergames in immersive environments (Lee, Park, & Wise, 2014). There is evidence of the impact of interactivity on online trust (Chen, Griffith, & Shen, 2005; Lee, 2005; Merrilees & Fry, 2003). Also, trust fosters users' emotions, both positive and negative, which affect continuance intention. Therefore, trust and emotions encourage the continuance intention of users. Additionally, since collaboration amongst customers is a competitive advantage, customer participation behaviour and involvement could be new strategic factors in digital marketing and social e-commerce. Interactivity and perceived personalisation influence customer participation behaviour and continuance intention in online purchase. Interactivity and perceived personalisation improve *'customer involvement with the service purchased in online environments'* (Blasco-Arcas *et al.*, 2014a:677).

Third, perceived interactivity is associated with mental imagery and imagination, and it is linked to feelings of social presence (Rodríguez-Ardura & Martínez-López, 2014, 2016), flow and spatial presence. For example, perceived interactivity produces feelings of social presence when triggered by online advertisements (Fortin & Dholakia, 2005). In line with this, perceived interactivity (Mollen & Wilson, 2010) is an antecedent of spatial presence (Rodríguez-Ardura & Martínez-López, 2014, 2016b) when customers browse online content (Singaraju *et al.*, 2016).

There is empirical evidence on the link of perceived interactivity, flow and defence in the context of personalised users' immersive experiences (Harwood & Garry, 2010). Our research has shown that perceived interactivity can stimulate feelings of psychological encouragement, support, and ultimately defence in users through macro-micro-macro links during value co-creation activities. Therefore, building relationships with customers during service practices in an emotional and affective way based on empathy (Delpechitre, Beeler-Connelly, & Chaker, 2018) can be a marketing goal for brands and firms.

Fourth, we suggest studying the roles that resource integration patterns (Edvardsson *et al.*, 2014), relational value (power) and the *choreography* (symbols and meaning) of spatial-temporal conditions play in the design of engagement platforms. Understanding the spatial and temporal conditions of resource integration processes facilitates designing interactive platforms' choreographic aspects (Storbacka, Brodie, Bohmann, Maglio, & Nenonen, 2016). Engagement

platforms connect users from different environments through physical and digital means, leading to the co-creation of relational value (power) (Peltz, 2003). The elaboration of standard models of C2C interaction is required to develop web services that connect high level business processes across the organisation. Several models are being developed, such as *orchestration* (to execute processes) (Andreas & Markus, 2018) and *choreography* (to develop sequences of messages between parties).

This means that customers can add value to the result by the integration of their personal operant resources. This added value can help managers to design and manage engagement platforms (Breidbach, Brodie, & Hollebeek, 2014). Furthermore, since the design of a virtual environment affects participants' behaviour, a direct benefit of interactivity is that it positively affects actual participation (Nambisan & Baron, 2009). Therefore, future research can study the link between interactivity, increased advocacy levels and actual participation in the design process of an engagement platform.

Fifth, future studies might expand our discussion on customer value co-creation behaviour from disembodied interaction (Gallagher, 2007) to embodied interaction. A new aspect based on the user's representation systems emerges from our conceptual model. This is the primary representation system with three main sensory channels (visual, auditory and kinaesthetic/haptic), most commonly used in human-computer interaction studies (Gallace, Ngo, Sulaitis, & Spence, 2012). The feeling of spatial presence integrates a triple type of sensory stimulation: haptic (kinaesthetic or tactile), auditory and visual. The auditory and visual conditions complement the physical experiences of the location where the user's body is placed (such as the seat of a virtual reality simulator), which is represented by the haptic (kinaesthetic or tactile) sense.

For this reason, an ideally *visualised* immersive environment could be reconstructed using parts of all the primary modalities of the senses with the help of media synchronisation (Huang, Sithu, & Ishibashi, 2018). Furthermore, using a primary representation system as a template representing embodied interaction could be valuable to study the factors that promote increased advocacy levels towards the brand, such as continuance intention and feelings of social and spatial presence and flow (Carlson, De Vries, Rahman, & Taylor, 2017).

Sixth, further research might be devoted to studying the effect in our model of the most critical direct network externality, that is, perceived network size (Katz & Shapiro, 1985). Perceived network size is related to the belief that the network's value of an individual user increases when other people also use the same service (Zhao & Lu, 2012). Furthermore, we believe that perceived network size will improve users' sense of control of the technology as the perception of ease of use increases (control-ease of use) (Lu, Deng, & Wang, 2010; Van Slyke *et al.*, 2007). This is because the provider puts more resources, content or functions to facilitate the use of the services when the user base grows and becomes larger. This enables users to get access to increased social support and information. In addition, users send the signal to other users that the service is easy to use (Van Slyke *et al.*, 2007).

A direct relationship between perceived network size and perceived ease of use has been established in previous studies (Lu, Deng, & Wang, 2010; Van Slyke *et al.*, 2007). An increased perceived network size intensifies perceived behavioural control and control-ease of use, so users obtain more knowledge and social support from the network (Tajvidi, Wang, Hajli, & Love, 2021). As more users communicate that the service is effortless, new users join the network that brings more user-friendly features, and appropriate functionalities are included to facilitate control-ease of use of the technology. Service providers may offer additional resources, information or

functionalities to improve user experience, while users can obtain more experience or social assistance from a more extensive support network. Then, other users can send signals that the service is easy to use and when the service is updated, or new add-ons are introduced, users will be more comfortable due to the signals that the service is easy to use (Van Slyke *et al.*, 2007).

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Appendix 1. Online survey in English

Dear user of Instagram, let me please take this opportunity to greet you and to please ask you to collaborate on an academic research to complete my doctoral thesis, tutored with professors Dr. Inma Rodríguez-Ardura and Dr. Antoni Meseguer-Artola at Universitat Oberta de Catalunya (UOC). The objective is to analyse the main drivers that explain the increase in the unplanned and voluntary usage of Instagram. For this to happen, I would appreciate if you could spare a few minutes of your busy agenda in order to complete the following questionnaire.

Below is the link to complete the questionnaire. The longest period the survey is available is three weeks and it takes no longer than twenty minutes to complete. Responses are treated as strictly confidential and in aggregated form; all participants will be provided with access to the link to see the results when the article is published. The results obtained will be used exclusively for academics and research purposes. By clicking on the following link: https://es.surveymonkey.com/r/B35X9L6 users have access to the below questionnaire in English:

Questionnaire for Instagram users

We thank you in advance for your help filling in this questionnaire. All information you provide us will remain confidential and will be used in an aggregate, and never individual, and exclusively for academic and research purposes. Please take your time because it is important that you answer all the questions thoroughly. Questionnaires that are not complete cannot be used in the investigation.

01. How old are you? ..... *(Please tick)*

- ☐ More than 55 years
- ☐ From 45 to 54 years
- ☐ From 35 to 44 years
- ☐ From 25 to 34 years
- ☐ From 18 to 24 years
- ☐ Less than 18 years

(If you are not over 18 you don't have to continue answering this questionnaire)

02. Do you access Instagram at least twice a week for a minimum of 10 minutes for personal reasons? ..... *(Please tick)* Yes ☐ No ☐

(If you do not usually access to Instagram at least twice a week for a minimum of 10 minutes per week for personal purposes, you don't have to continue answering this questionnaire)

Section 1 Your customer citizenship behaviour

Here you see a set of propositions about how your customer citizenship behaviour in Instagram is. Customer participation behaviour reflects your social facet in Instagram, due to your education, civility, and participation in your network of contacts, increasing the quality, efficiency and good reputation of Instagram. Customer participation behaviour measures solicited feedback and unsolicited feedback, advocacy, helping, tolerance and recommendation.

Please, use the following scale to rate your level of agreement or disagreement to the statements below.

	Strongly disagree			Neither agree nor disagree			Strongly agree
Unsolicited feedback on Instagram:							
1. UFE1. If I have a useful idea on how to improve an Instagram service, I let the social networking site know	1	2	3	4	5	6	7
2. UFE2. When I receive good service from Instagram, I comment on it.....	1	2	3	4	5	6	7
3. UFE3. When I experience a problem, I let Instagram know about it.....	1	2	3	4	5	6	7
Solicited feedback on Instagram:							
4. SFE1. If solicited, I fill out an Instagram customer satisfaction survey	1	2	3	4	5	6	7
5. SFE2. If solicited, I provide helpful feedback to an Instagram community manager.....	1	2	3	4	5	6	7
6. SFE3. If solicited, I provide information when surveyed by Instagram	1	2	3	4	5	6	7
7. SFE4. If solicited, I inform Instagram about the great service received by an individual community manager	1	2	3	4	5	6	7

Defence on Instagram:

8. DE1. I said positive things about Instagram and their followers to others	1	2	3	4	5	6	7
9. DE2. I recommend Instagram and their followers to others	1	2	3	4	5	6	7
10. DE3. I encourage friends and relatives to use Instagram	1	2	3	4	5	6	7

Helping on Instagram:

11. HE1. I assist other users if they need my help.	1	2	3	4	5	6	7
12. HE2. I help other users if they seem to have problems	1	2	3	4	5	6	7
13. HE3. I teach other users to use the Instagram service correctly	1	2	3	4	5	6	7
14. HE4. I give advice to other users	1	2	3	4	5	6	7

Tolerance on Instagram:

15. TO1. If Instagram's service is not delivered as expected, I would be willing to accept it	1	2	3	4	5	6	7
16. TO2. If Instagram makes a mistake during service delivery, I would be willing to be patient	1	2	3	4	5	6	7
17. TO3. If I have to wait longer than I usually expect to receive the Instagram service, I would be willing to adapt	1	2	3	4	5	6	7

Recommendation on Instagram:

18. RE1. I refer fellow students or co-workers to Instagram	1	2	3	4	5	6	7
19. RE2. I recommend Instagram to my family.	1	2	3	4	5	6	7
20. RE3. I recommend Instagram to my peers.	1	2	3	4	5	6	7
21. RE4. I recommend the social networking site to people interested in Instagram's products/services	1	2	3	4	5	6	7

Section 2 Your customer participation behaviour

In this part of the questionnaire, you can find some statements about your customer participation behaviour in Instagram. Customer participation behaviour reflects your individual characteristics such as your skills, knowledge, and the contacts you share with other users of Instagram due to your interpersonal abilities, such as kindness and respect. Customer participation behaviour measures information seeking, information sharing, responsible behaviour, and personal intention.

Please, use the following scale to rate your level of agreement or disagreement to the statements about customer participation behaviour on Instagram.

	Strongly disagree			Neither agree nor disagree			Strongly agree
Information seeking on Instagram:							
22. ISE1. I have asked others for information on what Instagram offers	1	2	3	4	5	6	7
23. ISE2. I have searched for information on where Instagram is located	1	2	3	4	5	6	7
24. ISE3. I have paid attention to how others behave in order to use Instagram well	1	2	3	4	5	6	7

Information sharing on Instagram:

25. ISH1. I clearly explained what I wanted the followers to do	1	2	3	4	5	6	7
26. ISH2. I gave the followers proper information	1	2	3	4	5	6	7
27. ISH3. I provided necessary information so that the followers could perform his or her duties	1	2	3	4	5	6	7
28. ISH4. I answered all the followers' service-related questions	1	2	3	4	5	6	7

Responsible behaviour on Instagram:

29. RB1. I performed all the tasks that are required	1	2	3	4	5	6	7
30. RB2. I adequately completed all the expected behaviours	1	2	3	4	5	6	7
31. RB3. I fulfilled responsibilities to Instagram	1	2	3	4	5	6	7
32. RB4. I followed the follower's directives or orders	1	2	3	4	5	6	7

Personal intention on Instagram:

33. PI1. I was friendly to the followers	1	2	3	4	5	6	7
34. PI2. I was kind to the followers	1	2	3	4	5	6	7
35. PI3. I was polite to the followers	1	2	3	4	5	6	7
36. PI4. I was courteous to the followers	1	2	3	4	5	6	7
37. PI5. I acted rudely with the followers (reverse coding)	1	2	3	4	5	6	7

Section 3 Your experience of network interactivity

In this part of the questionnaire, you can find some statements on network interactivity, this is that a later message refers to a previous message that in turn refers to an even prior message. Network interactivity measures four characteristics: perceived personalisation, playfulness, connectedness, and responsiveness.

Now you know the meaning of the network interactivity experience, think about yourself while navigating in Instagram. Please read the following statements and use the proposed scales to express the situation that better fits with your own experience.

	Strongly disagree			Neither agree nor disagree			Strongly agree
Perceived personalisation on Instagram:							
38. PP1. I feel I just had a personal conversation with a sociable, knowledgeable, and warm user from Instagram	1	2	3	4	5	6	7
39. PP2. It was like Instagram was talking back to me while I clicked through	1	2	3	4	5	6	7
40. PP3. I perceived Instagram not to be sensitive to my needs for service information (reverse coding)	1	2	3	4	5	6	7
41. PP4. I perceived Instagram to enable me to choose and learn the content I need	1	2	3	4	5	6	7
42. PP5. I felt Instagram can make me feel that I am a unique user	1	2	3	4	5	6	7

Playfulness on Instagram:

43. PL1. I think using the Instagram service is interesting	1	2	3	4	5	6	7
44. PL2. I think using the Instagram service is enjoyable	1	2	3	4	5	6	7
45. PL3. I think using the Instagram service is exciting	1	2	3	4	5	6	7
46. PL4. I think using the Instagram service is fun	1	2	3	4	5	6	7

Connectedness on Instagram:

47. CONN1. Users of the Instagram service share their experiences and feelings with others through this communication tool	1	2	3	4	5	6	7
48. CONN2. Users of the Instagram service benefit from the user community using this service.	1	2	3	4	5	6	7
49. CONN3. Users of the Instagram service share a common bond with other members of the user community who are using the service	1	2	3	4	5	6	7
50. CONN4. Users share experiences about the product or services with other users of Instagram	1	2	3	4	5	6	7
51. CONN5. The users of Instagram do not benefit from the community visiting this social networking site (reverse coding)	1	2	3	4	5	6	7

Responsiveness on Instagram:

52. RES1. When I'm using the Instagram service, other users are very responsive to my posts	1	2	3	4	5	6	7
53. RES2. When I'm using the Instagram service, I can always count on getting a lot of responses to my posts	1	2	3	4	5	6	7
54. RES3. When I'm using the Instagram service, I can't always count on getting responses to my posts fairly quickly (reverse coding)	1	2	3	4	5	6	7
55. RES4. I could communicate with Instagram directly for further questions about the application or its products if I wanted to	1	2	3	4	5	6	7
56. RES5. Instagram had the ability to respond to my specific questions quickly and efficiently	1	2	3	4	5	6	7
57. RES6. I could communicate in real time with other users who shared my interest in Instagram	1	2	3	4	5	6	7

Section 4 Your experience of perceived interactivity

In this part of the questionnaire, we define perceived interactivity as the degree to which users modify the digital medium and the information exchange during human-computer interaction in real time. PI Perceived interactivity measures five characteristics: two-way communication, control-ease, active control, perceived behavioural control and synchronicity.

Now you know the meaning of the perceived interactivity, think about yourself while browsing Instagram. Please read the following statements and use the proposed scales to express the situation that better fits with your own experience.

Two-way communication on Instagram:	**Strongly disagree**			**Neither agree nor disagree**			**Strongly agree**
58. TWC1. Instagram enables conversation	1	2	3	4	5	6	7
59. TWC2. Instagram facilitates two-way communication between the visitor and the site	1	2	3	4	5	6	7
60. TWC3. It is not difficult to offer feedback to Instagram	1	2	3	4	5	6	7
61. TWC4. Instagram makes me feel it wants to listen to its visitors	1	2	3	4	5	6	7
62. TWC5. Instagram does not at all encourage visitors to talk back (reverse coding)	1	2	3	4	5	6	7
63. TWC6. Instagram gives visitors the opportunity to talk back	1	2	3	4	5	6	7

Control-ease of use on Instagram:

64. CON1. Learning to use the Instagram service is easy for me	1	2	3	4	5	6	7
65. CON2. I find it easy to get the Instagram service to do what I want it to do	1	2	3	4	5	6	7
66. CON3. The process of using the Instagram service is clear and understandable	1	2	3	4	5	6	7

Active Control on Instagram:

67. ACN1. I felt that I had a lot of control over my visiting experience at Instagram	1	2	3	4	5	6	7
68. ACN2. While I was on Instagram, I could choose freely what I wanted to see	1	2	3	4	5	6	7
69. ACN3. While surfing Instagram, I had absolutely no control over what I can do on the social networking site (reverse coding)	1	2	3	4	5	6	7
70. ACN4. While surfing Instagram, my actions decided the kind of experiences I had	1	2	3	4	5	6	7

Perceived behavioural control on Instagram:

71. PBC1. I was in control over the information display format condition when using Instagram	1	2	3	4	5	6	7
72. PBC2. I was in control over the content I wanted to see on Instagram	1	2	3	4	5	6	7
73. PBC3. I was in control of my navigation through Instagram	1	2	3	4	5	6	7
74. PBC4. I was not in total control over the pace of my visit to Instagram (reverse coding)	1	2	3	4	5	6	7
75. PUBC5. I could communicate with Instagram directly for further questions about the company or its products if I wanted to	1	2	3	4	5	6	7

Synchronicity on Instagram:

76. SIN1. Instagram processed my input very quickly.....	**1**	**2**	**3**	**4**	**5**	**6**	**7**
77. SIN2. Getting information from Instagram is very fast.....	**1**	**2**	**3**	**4**	**5**	**6**	**7**
78. SIN3. I was able to obtain the information I want without any delay.....	**1**	**2**	**3**	**4**	**5**	**6**	**7**
79. SIN4. When I click on the links, I felt I was getting instantaneous information	**1**	**2**	**3**	**4**	**5**	**6**	**7**
80. SIN5. Instagram was very slow in responding to my requests (reversed coding).....	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Section 5 Instagram usage

Following there are some questions about your usage of Instagram. Please use the answer scale to express the situation that best fits with your case.

81. About how many Instagram followers do you have? .....

Menos de 11 amigos | De 11 a 50 amigos | De 51 a 100 amigos | De 101 a 150 amigos | De 151 a 200 amigos | De 201 a 250 amigos | De 251 a 300 amigos | De 301 a 400 amigos | Mas de 401 amigos

82. In the past week, on average, how much time per day did you spend on Instagram? .....

De 10 a 30 minutos | De 31 a 60 minutos | De 1 a 2 horas | De 2 a 3 horas | Mas de 3 horas

83. How do you usually access to Instagram?.....
(Please tick as many devices as you use)

☐ Computer ☐ Tablet
☐ Smartphone (iPhone, Samsung Galaxy…) ☐ iPod touch, Samsung Galaxy Player
☐ Digital camera ☐ Game console
☐ Music and Video player ☐ Internet enabled TV

Section 6 Classification variables

This set of final questions asks details about you. Remember this data is confidential.

84. Are you? ..... ☐ Female ☐ Male

85. What is your nationality? .....
(Please fill in)

86. Which is the highest level of education that you have completed? .....
☐ No formal education
☐ Primary education
☐ Secondary education
☐ University education

87. Do you have children? ..... ☐ Yes ☐ No

88. In case of having children, do they use Instagram?..... ☐ Yes ☐ No

If you have any comments about this questionnaire, please feel free to write the following:

Thank you for your time – Your contribution is greatly appreciated.

Appendix 2. Online survey in Spanish

Estimado usuario de Instagram, permíteme por favor aprovechar esta oportunidad para saludarte y pedir tu colaboración en una investigación académica para completar mi tesis doctoral, tutorizada por los profesores Dra. Inma Rodríguez-Ardura y Dr. Antoni Meseguer-Artola de la Universitat Oberta de Catalunya (UOC). El objetivo es analizar los principales factores que explican el incremento del uso no planificado y voluntario de Instagram. Para ello, te agradecería si dedicaras unos minutos de tu apretada agenda para completar el siguiente cuestionario.

A continuación, se muestra el enlace para completar el cuestionario. El plazo máximo para responder esta encuesta son tres semanas y la encuesta no lleva más de veinte minutos. Las respuestas se tratan de manera estrictamente confidencial y de forma agregada, y nunca de manera individual; todos los participantes tendrán acceso a los resultados cuando se publique la tesis. Los resultados obtenidos se utilizarán exclusivamente para fines académicos y de investigación. Al hacer clic en el siguiente enlace: https://es.surveymonkey.com/r/B35X9L6?lang=es *los usuarios tienen acceso al siguiente cuestionario en español:*

Cuestionario para los usuarios de Instagram

Agradecerte de antemano tu colaboración rellenando este cuestionario. Toda la información que nos proporciones será usada de manera estrictamente confidencial y de forma agregada, y nunca de manera individual. Por favor, tomate tu tiempo porque es importante que respondas todas las preguntas cuidadosamente. Cuestionarios que no estén completos no podrán ser utilizados en la investigación.

01. ¿Cuántos años tienes? ..... *(Por favor, marca)*

- ☐ Mas de 55 años
- ☐ De 45 a 55 años
- ☐ De 35 a 44 años
- ☐ De 25 a 34 años
- ☐ De 18 a 24 años
- ☐ Menos de 18 años →

(Si no tienes 18 o más, no tienes que seguir respondiendo este cuestionario)

02. ¿Accedes a Instagram al menos dos veces por semana por un mínimo de 10 minutos por razones personales? ..... *(Por favor, marca)*

- ☐ Si
- ☐ No →

(Si normalmente no accedes a Instagram por lo menos dos veces a la semana por un mínimo de 10 minutos por razones personales, no tienes que seguir respondiendo este cuestionario)

Sección 1 Tu comportamiento ciudadano del consumidor

Aquí mostramos afirmaciones sobre tu comportamiento ciudadano de consumidor. El comportamiento ciudadano refleja tu faceta social en Instagram, es decir la educación, el civismo y la solidaridad con la que te desenvuelves entre tu red de contactos, aumentando la calidad, la eficiencia y la buena reputación de Instagram. El comportamiento ciudadano mide las valoraciones solicitadas y no solicitadas, la defensa, la disposición a ayudar, la tolerancia y la recomendación.

Por favor, usa la siguiente escala para calificar tu nivel de acuerdo o desacuerdo con las declaraciones a continuación.

	Totalmente en desacuerdo			Ni de acuerdo ni en desacuerdo			Totalmente de acuerdo
Valoraciones no solicitadas en Instagram:							
1. UFE1. Si tengo una idea útil sobre cómo mejorar un servicio de Instagram, lo dejo saber en la red social	1	2	3	4	5	6	7
2. UFE2. Cuando un servicio en Instagram es bueno, lo comento.....	1	2	3	4	5	6	7
3. UFE3. Cuando experimento un problema, lo dejo saber en Instagram.....	1	2	3	4	5	6	7
Valoraciones solicitadas en Instagram:							
4. SFE1. Si se me pide, relleno una encuesta de satisfacción de cliente de Instagram.....	1	2	3	4	5	6	7
5. SFE2. Si se me pide, proporciono comentarios útiles a un administrador de Instagram.....	1	2	3	4	5	6	7
6. SFE3. Si se me pide, proporciono información cuando soy encuestado por Instagram.....	1	2	3	4	5	6	7
7. SFE4. Si se me pide, informo a Instagram del gran servicio recibido por un administrador....	1	2	3	4	5	6	7

Defensa en Instagram:

8. AD1. Digo cosas positivas de Instagram y sus seguidores a otros	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9. AD2. Recomiendo Instagram y sus seguidores a otros	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10. AD3. Animo a amigos y familiares a usar Instagram	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Disposición a ayudar en Instagram:

11. HE1. Asisto a otros usuarios si necesitan mi ayuda	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12. HE2. Ayudo a otros usuarios si parecen tener problemas	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13. HE3. Enseño a otros usuarios a usar Instagram correctamente	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14. HE4. Doy consejos a otros usuarios	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Tolerancia en Instagram:

15. TO1. Si la sesión de Instagram no se presta como se esperaba, lo aceptaría	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16. TO2. Si Instagram falla durante la navegación, seria tolerante	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17. TO3. Si tengo que esperar más de lo pensado para navegar en Instagram, me adaptaría	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Recomendar en Instagram:

18. RE1. Sugiero Instagram a mis compañeros de estudio o colegas de trabajo	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19. RE2. Recomiendo Instagram a mi familia	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20. RE3. Recomiendo Instagram a mis amigos.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21. RE4. Recomiendo la red social a las personas interesadas en los productos/servicios de Instagram	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Sección 2 Tu comportamiento participativo de consumidor

En esta parte del cuestionario puedes encontrar enunciados sobre tu comportamiento participativo en Instagram. El comportamiento participativo refleja tus características individuales como tus aptitudes, tus conocimientos y los contactos que compartes con otros usuarios de Instagram debido a tus habilidades interpersonales, como son la bondad y el respeto. El comportamiento participativo mide la búsqueda de información, el intercambio de información, el comportamiento responsable y la intención personal.

Por favor, usa la siguiente escala para calificar tu nivel de acuerdo o desacuerdo con las declaraciones sobre tu comportamiento participativo en Instagram.

Búsqueda de información en Instagram:	**Totalmente en desacuerdo**			**Ni de acuerdo ni en desacuerdo**			**Totalmente de acuerdo**
22. ISE1. He pedido a otros información sobre lo que ofrece Instagram	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23. ISE2. He buscado información sobre dónde encontrar Instagram	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24. ISE3. He prestado atención a cómo se comportan los demás para usar Instagram bien	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Intercambio de información en Instagram:

25. ISH1. Expliqué con claridad lo que quería que hicieran los seguidores	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26. ISH2. Les di a los seguidores información correcta	**1**	**2**	**3**	**4**	**5**	**6**	**7**
27. ISH3. Proporcioné las respuestas oportunas para que los seguidores puedan continuar sus tareas	**1**	**2**	**3**	**4**	**5**	**6**	**7**
28. ISH4. Respondí todas las preguntas durante la sesión de Instagram a los seguidores	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Comportamiento responsable en Instagram:

29. RB1. Realizo todas las tareas que me han pedido	1	2	3	4	5	6	7
30. RB2. Cumplo adecuadamente con mi comportamiento esperado	1	2	3	4	5	6	7
31. RB3. Cumplo con mis responsabilidades con Instagram	1	2	3	4	5	6	7
32. RB4. Hago caso a las peticiones de los seguidores	1	2	3	4	5	6	7

Intención personal en Instagram:

33. PI1. Soy amigable con los seguidores	1	2	3	4	5	6	7
34. PI2. Soy amable con los seguidores	1	2	3	4	5	6	7
35. PI3. Soy educado con los seguidores	1	2	3	4	5	6	7
36. PI4. Soy cortes con los seguidores	1	2	3	4	5	6	7
37. PI5. Soy grosero con los seguidores (codificación inversa)	1	2	3	4	5	6	7

Sección 3 Tu experiencia de Interactividad en red

En esta parte del cuestionario puedes encontrar enunciados sobre tu interactividad en red, es decir que un mensaje posterior se refiere a un mensaje anterior que, a su vez, se refiere a un mensaje incluso anterior. La interactividad en red mide cuatro características: personalización percibida, diversión, conectividad y la capacidad de respuesta.

Ahora que conoces el significado de la experiencia de interactividad en red, piensa en ti mismo mientras navegas en Instagram. Lee las siguientes declaraciones y utiliza las escalas propuestas para expresar la situación que mejor se ajusta a tu propia experiencia.

Personalización percibida en Instagram:	**Totalmente en desacuerdo**			**Ni de acuerdo ni en desacuerdo**			**Totalmente de acuerdo**
38. PP1. Siento que mantengo conversaciones con usuarios de Instagram cercanos, sociables y expertos	1	2	3	4	5	6	7
39. PP2. Es como si conversara con Instagram mientras navego	1	2	3	4	5	6	7
40. PP3. Percibo que Instagram no es sensible a mis necesidades de información (codificación inversa)	1	2	3	4	5	6	7
41. PP4. Percibo que Instagram permite que elija y aprenda de los contenidos que necesito	1	2	3	4	5	6	7
42. PP5. Siento que Instagram puede hacerme sentir que soy un usuario único	1	2	3	4	5	6	7

Diversión en Instagram:

43. PL1. Pienso que usar Instagram es interesante	1	2	3	4	5	6	7
44. PL2. Pienso que usar Instagram es agradable	1	2	3	4	5	6	7
45. PL3. Pienso que usar Instagram es emocionante	1	2	3	4	5	6	7
46. PL4. Pienso que usar Instagram es divertido	1	2	3	4	5	6	7

Conectividad en Instagram:

47. CONN1. Los usuarios de Instagram comparten sus experiencias y sentimientos con otros usuarios a través de esta herramienta de comunicación	1	2	3	4	5	6	7
48. CONN2. Los usuarios de Instagram se benefician de la comunidad de usuarios que la usan	1	2	3	4	5	6	7
49. CONN3. Los usuarios de Instagram comparten un vínculo común con otros usuarios de la comunidad de Instagram	1	2	3	4	5	6	7
50. CONN4. Los usuarios comparten experiencias de productos y/o servicios con otros	1	2	3	4	5	6	7

usuarios de Instagram .....

51. CONN5. Los usuarios de Instagram no se benefician de la comunidad que visita Instagram (codificación inversa) 1 2 3 4 5 6 7

Capacidad de respuesta en Instagram:

52. RES1. Cuando uso Instagram, otros usuarios son muy receptivos a mis posts..... 1 2 3 4 5 6 7
53. RES2. Cuando uso Instagram, siempre puedo contar con obtener muchas respuestas a mis posts 1 2 3 4 5 6 7
54. RES3. Cuando uso Instagram, no siempre puedo contar con obtener respuestas a mis publicaciones con bastante rapidez (codificación inversa) 1 2 3 4 5 6 7
55. RES4. Puedo comunicarme con Instagram directamente para preguntar sobre la aplicación o sus productos si yo quisiera..... 1 2 3 4 5 6 7
56. RES5. Instagram tiene la capacidad de responder a mis preguntas específicas de forma rápida y eficiente 1 2 3 4 5 6 7
57. RES6. Puedo comunicarme en tiempo real con otros usuarios que compartieron mis intereses en Instagram 1 2 3 4 5 6 7

Sección 4 Tu experiencia de interactividad percibida

En esta parte del cuestionario definimos la interactividad percibida como el grado en que los usuarios modifican el medio digital y el intercambio de información durante la interacción persona-ordenador en tiempo real. La interactividad percibida mide cinco características: comunicación bidireccional, control-fácil de usar, control activo, control de comportamiento percibido y sincronicidad.

Ahora que conoces el significado de la interactividad percibida, piensa en ti mismo cuando navegas en Instagram. Lee las siguientes afirmaciones y usa las escalas propuestas para describir la situación que mejor se ajuste a tu propia experiencia.

Comunicación bidireccional en Instagram:	**Totalmente en desacuerdo**			**Ni de acuerdo ni en desacuerdo**			**Totalmente de acuerdo**
58. TWC1. Instagram permite la conversación	1	2	3	4	5	6	7
59. TWC2. Instagram facilita la comunicación bidireccional entre el usuario e Instagram	1	2	3	4	5	6	7
60. TWC3. No es difícil hacer comentarios a Instagram	1	2	3	4	5	6	7
61. TWC4. Instagram me hace sentir que quiere escuchar a los que navegan en ella.....	1	2	3	4	5	6	7
62. TWC5. Instagram no incita a los visitantes a responder (codificación inversa).....	1	2	3	4	5	6	7
63. TWC6. Instagram da a los visitantes la oportunidad de responder	1	2	3	4	5	6	7
Control-fácil de usar en Instagram:							
64. CON1. Aprender a usar Instagram es fácil para mí	1	2	3	4	5	6	7
65. CON2. Me resulta fácil hacer que Instagram haga lo que yo quiero que haga	1	2	3	4	5	6	7
66. CON3. El proceso de usar Instagram es claro y comprensible	1	2	3	4	5	6	7
Control activo en Instagram:							
67. ACN1. Siento que tengo mucho control sobre mis experiencias navegando en Instagram ..	1	2	3	4	5	6	7
68. ACN2. Mientras estoy en Instagram, puedo elegir libremente lo que quiero ver.....	1	2	3	4	5	6	7
69. ACN3. Mientras navego en Instagram, no tengo absolutamente ningún control sobre lo que puedo hacer en la red social (codificación inversa)	1	2	3	4	5	6	7
70. ACN4. Mientras navego en Instagram, mis acciones deciden el tipo de experiencias que tengo	1	2	3	4	5	6	7
Control de comportamiento percibido en Instagram:							
	1	2	3	4	5	6	7

71. PBC1. Yo tengo el control sobre el formato de visualización de la información cuando uso Instagram.....							
72. PBC2. Yo tengo el control del contenido que quiero ver en Instagram	1	2	3	4	5	6	7
73. PBC3. Yo tengo el control de mi navegación en Instagram	1	2	3	4	5	6	7
74. PBC4. Yo no tengo el control sobre el ritmo de mis visitas a Instagram (codificación inversa)	1	2	3	4	5	6	7
75. PBC5. Yo puedo comunicarme directamente con Instagram para más preguntas sobre la compañía o sus productos si quisiera	1	2	3	4	5	6	7

Sincronicidad en Instagram:

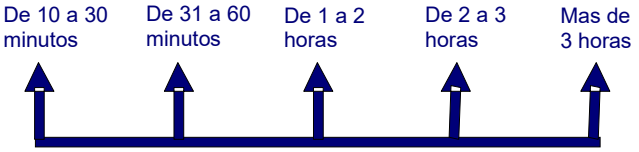
76. SIN1. Instagram procesa mis posts de manera muy rápida.....	1	2	3	4	5	6	7
77. SIN2. Se puede obtener información muy rápidamente de Instagram.....	1	2	3	4	5	6	7
78. SIN3. Soy capaz de obtener la información que quiero sin ningún retraso.....	1	2	3	4	5	6	7
79. SIN4. Cuando hago clic en los enlaces, siento que estoy obteniendo información instantáneamente.....	1	2	3	4	5	6	7
80. SIN5. Instagram es muy lenta en responder a mis peticiones (codificación inversa).....	1	2	3	4	5	6	7

Sección 5 Uso de Instagram

En esta sección hay preguntas sobre el uso que haces de Instagram. Por favor, usa las siguientes escalas para expresar en cada caso la situación que mejor se corresponde con tu caso.

81. Aproximadamente, ¿cuántos amigos/as tienes en Instagram?

82. Durante la semana pasada, de promedio, ¿cuánto tiempo al día estuviste en Instagram? .....



83. ¿Desde donde accedes habitualmente a Instagram?.
(Marca con una X tantos dispositivos como uses)

☐ Ordenador ☐ Tablet
☐ Smartphone (iPhone, Samsung Galaxy…) ☐ iPod touch, Samsung Galaxy Player
☐ Cámara digital ☐ Videoconsola
☐ Reproductor de música y video ☐ TV con internet

Sección 6 Variables de clasificación

En esta última sección se requiere que contestes a unas preguntas personales. Recuerda que estos datos se tratan de manera confidencial.

84. ¿Eres? *(Por favor marca con una X)* ☐ Hombre ☐ Mujer

85. ¿Cuál es tu nacionalidad? ..... *(Espacio a completar)*

86. ¿Cuál es el nivel más alto de estudios que has completado?
☐ Sin estudios
☐ Estudios primarios
☐ Estudios secundarios
☐ Estudios universitarios

87. ¿Tienes hijos/as? ☐ Si ☐ No

88. En caso de tener hijos/as, ¿usan Instagram? ☐ Si ☐ No

Si tienes algún comentario, por favor, escríbelo a continuación:

Gracias por tu tiempo – te agradecemos mucho tu contribución.