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Research Article

Information management can't be all fun and games, can it? How gamified experiences foster information exchange in multi-actor service ecosystems

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ABSTRACT

This paper investigates whether gamified experiences in a multi-actor service ecosystem can be used to encourage customers' information exchange behavior. Furthermore, it examines the impact of customers' knowledge sharing attitude on the relationship between experiential value and customers' information exchange behavior. Structural equation modeling was used to assess these dynamic relationships and provide a scalable measurement instrument that can be applied to gamified experiences ranging from simple customer-interface interactions, all the way up to multi-actor service ecosystems. Our findings support the notion that managers can use gamification to foster information exchange and thereby value co-creation between customers and employees directly, without necessarily having to change customers attitudes first. The findings also suggest that gamification can be applied successfully in cases of large groups of people with widely varying characteristics, backgrounds, and motivations. Additionally, our research indicates that experiential value is a suitable candidate for a consistent measurement instrument for gamification. This study is the first to apply a holistic experiential value approach to a gamified experience that simultaneously accounts for customers' interactions with a multisensory physical environment, their personal interactions with employees, and their interactions with other customers.

1. Introduction

While modern customers are becoming more and more knowledgeable (e.g., Bagheri, Kusters, & Trienekens, 2019; Prahalad & Ramaswamy, 2004; Verhoef, Kannan, & Inman, 2015), companies increasingly face the challenge of acquiring customer-related knowledge, as it is considered to be crucial for the provision of products and services that meet customer demands (Bagheri et al., 2019). Customers' willingness and ability to engage in information seeking and information sharing is necessary for any value creation to occur (e.g., Delpechitre, Beeler-Connelly, & Chaker, 2018; Groth, 2005; Revilla-Camacho, Vega-Vázquez, & Cossío-Silva, 2015; Yi & Gong, 2013). Therefore, information management must now move beyond merely managing activities around collecting and storing information to concentrate more on facilitating customer exchange behaviors. Among the many methods used to influence customers' behavior, gamified experiences have proven to be very successful in achieving high levels of engagement (e.g., Hamari & Koivisto, 2014; Harwood & Garry, 2015; Kuo & Chuang, 2016) and gamification increasingly draws the attention of both academics and practitioners due to its power to generate experiential value for customers (e.g., Eppmann, Bekk, & Klein, 2018; Hammedi, Leclerq, & Van Riel, 2017; Leclercq, Poncin, Hammedi, Kullak, & Hollebeek, 2020).

The concept of gamification has been explored previously in areas such as marketing (e.g., Berger, Schlager, Sprott, & Herrmann, 2018; Hofacker, de Ruyter, Lurie, Manchanda, & Donaldson, 2016; Mishra & Malhotra, 2020; Müller-Stewens, Schlager, Häubl, & Herrmann, 2017; Whittaker, Mulcahy, & Russell-Bennett, 2021), and retailing (Poncin, Garnier, Ben Mimoun, & Leclercq, 2017), e-commerce (Zhang, Shao, Li, & Feng, 2020), tourism (Hsiao & Tang, 2021), health management (Spil, Romijnders, Sundaram, Wickramasinghe, & Kijl, 2021; Windasari, Lin, & Kato-Lin, 2021) and there is evidence that gameful experiences can increase user engagement (Bitrián, Buil, & Catalán, 2021), influence customer behavior (Rodrigues, Costa, & Oliveira, 2016) and foster

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behavioral engagement (Jang, Kitchen, & Kim, 2018). However, there is also evidence that gamification does not always works as intended (Hammedi, Leclercq, Poncin, & Alkire (Née Nasr), 2021; Leclercq, Poncin, & Hammedi, 2020; Wolf, Weiger, & Hammerschmidt, 2020). In fact, some researchers even caution against the use of gamification, highlighting potential challenges (e.g., inability to participate due to absence of skills) and potential drawbacks such as over participation (Hammedi et al., 2017), customer disengagement (Leclercq, Hammedi, & Poncin, 2018) or a negative effect on users experience and contributions (Leclercq et al., 2020). Considering that gamified experiences may be applied in a number of different ways, we believe an investigation into successful parings between experiential and behavioral outcomes is necessary (Liu, Santhanam, & Webster, 2017).

In the current research we will operationalize gamification as a process of supporting a customer's "overall value creation" (Huotari & Hamari, 2017, p. 25) through gameful experiences that can occur either individually or within a "socially interactive" (Howard & Gengler, 2001, p. 189) setting where multiple employees and customers share the same physical environment. This is particularly important because any individual customer's reaction to an experience can influence the value of the interaction for other participating customers (Grove & Fisk, 1997). Therefore, in multi-actor service ecosystems it is necessary to shift the focus from dyadic interactions toward interactions occurring between and within groups of actors (Li, Juric, & Brodie, 2017).

Although companies increasingly use gamification to achieve their goals (e.g., engage customers) and despite the growing body of literature on that topic, considerable knowledge gaps inhibit the design and subsequent deployment of effective gamification approaches (Hollebeek, Das, & Shukla, 2021; Leclercq et al., 2018; Morschheuser, Hassan, Werder, & Hamari, 2018; Wünderlich, Gustafsson, Hamari, Parvinen, & Haff, 2020). We have highlighted three gaps, which in our opinion need immediate attention. First, gamification research and applications have typically centered around the potential influence on human behavior without much consideration for the issues and aspects which precede the effects of a gamification effort (Koivisto & Hamari, 2019). While research has started to investigate gamification and its relation to an actor's motivation and behavior, research is still not able to match specific gamification elements to specific motivational and/or behavioral outcomes (Warmelink, Koivisto, Mayer, Vesa, & Hamari, 2020). Instead of predominantly focusing on measuring the effects of gamification, future research is asked to shift its focus toward aspects "that precede the effects of gamification on human behavior and motivation, such as attitudes" (Koivisto & Hamari, 2019, p. 205). Secondly, research is sparse regarding the challenge of stimulating engagement among large groups of people with widely varying characteristics and backgrounds (Koivisto & Hamari, 2019). As mentioned previously, a gamified experience can take place in socially interactive settings among the presence of other known or unknown actors. There are examples from practice of successfully implemented gamification approaches in such interactive settings, e.g., "piano staircase" (Peeters, Megens, van den Hoven, Hummels, & Brombacher, 2013) or "all eyes on Samsung S4″ (Busch, 2013); however, research regarding those applications thus far is limited. Third, it has been difficult to compare results across research studies due to the lack of a consistent and validated measurement instrument which can be applied to gamified experiences (Koivisto & Hamari, 2019). However, it is of utmost importance for information management to understand and measure both the antecedents and consequences of gamification in socially interactive settings. This will help managers to (1), influence their customers to engage in information exchange behaviors and (2), enable decision makers to improve their strategies regarding the application of gamified experiences.

Thus, the purpose of this study is to investigate whether the experiential value, generated through the gamified experience in a multi-actor service ecosystem, can be used to encourage customers' information exchange behavior. Furthermore, our research examines the impact of customers' knowledge sharing attitude on the relationship between experiential value of a gamified experience and customers' information exchange behavior. And finally, our study examines the role of customers' attitudes as an antecedent to the effects of gamification. We use structural equation modeling to assess these dynamic relationships and provide a scalable measurement instrument that can be applied to gamified experiences ranging from simple customer-interface interactions, all the way up to multi-actor service ecosystems. In contrast to prior research, this study is the first to apply a holistic experiential value approach to a gamified experience that simultaneously accounts for customers' interactions with a multisensory physical environment, their personal interactions with employees, and their interactions with other customers. This will be useful to researchers in understanding the interplay between customers' knowledge sharing attitude and the actual information exchange behavior. However, it is also highly relevant for managers, as it sheds light on the possibility of behaviors that can be directly influenced without first needing to change a customer's attitude.

2. Literature review

2.1. Gamified experiences

The gamified experience has been defined as a "psychological state resulting from the interaction of […] perceiving presented goals to be non-trivial and achievable, being motivated to pursue those goals under arbitrary, externally-imposed constraints, and [the belief that] their actions within these constraints [are] volitional" (Landers et al., 2019, pp. 83–84). In other words, the gamified experience is the "psychological consequence" (Eppmann et al., 2018, p. 99) of using a successfully gamified service. Gamified experiences, also referred to as "game-like" (Hammedi et al., 2017, p. 3) or "gameful" (e.g., Leclercq et al., 2020; Wolf et al., 2020) experiences, are experiences infused with gameful affordances, in a typically non-game context, to deliver experiences similar to those created through games (Deterding, Dixon, Khaled, & Nacke, 2011; Huotari & Hamari, 2017; Warmelink et al., 2020).

Gamified experiences are co-created in interactions between the user (s) and the gamified service (Högberg, Hamari et al., 2019; Huotari & Hamari, 2017). From a business perspective, the ultimate goal of creating gamified experiences is to motivate "firm-beneficial user behavior" (Wolf et al., 2020, p. 1). Some examples of such behaviors are customers' willingness to accept higher prices and customer loyalty (Wolf et al., 2020) or engagement (Högberg & Ramberg, 2019; Jang et al., 2018).

Among the various elements and mechanics that structure games, research indicates that achievement and progression-oriented affordances (e.g., points, badges, rankings) are a more common way to gamify experiences than social-oriented (e.g., competition, cooperation), immersion-oriented (e.g. avatar, virtual identity), real world-related (e.g., physical objects, prizes) and miscellaneous elements (e.g., virtual currency, notifications) (Koivisto & Hamari, 2019).

2.2. Information exchange

Information enables both customers and companies alike to make (the right) decisions and solve problems (Guo, 2011). Within multi-actor service ecosystems, actors engage in information exchange by seeking information but also sharing information (with each other) (Wilson, 1999).

Information-seeking behavior is defined as the "purposive acquisition of information from selected information carriers" (Johnson, Donohue, Atkin, & Johnson, 1995, p. 275). It refers to an actor's way of gathering and utilizing information (Kakai, Odongo, & Bukenya, 2004). Information-seeking, respectively, the information received through the activity, is important to customers because it enables them to successfully co-create value with other actors of the ecosystem (Yi & Gong, 2013).

Information-sharing behavior includes the provision of information to other actors and confirming that the recipient(s) has (have) received and understood that information (Sonnenwald, 2006). Information-sharing is key to successful value co-creation (Yi & Gong, 2013) as customers can ensure that the service they receive matches their individual needs (Ennew & Binks, 1999).

There are three different ways to model the relationship between information seeking and sharing. While the indirect approach "conceptualizes information seeking and sharing as discrete activities connected by an intermediating factor, […] the sequential approach assumes that information seeking precedes information sharing" (Savolainen, 2019, p. 518). This study approaches information exchange from the viewpoint of the interactive approach, hence, information seeking and sharing are interpreted as activities that have no fixed temporal order and both activities (can) influence each other so that transmitted information (information-sharing) leads to new questions (information-seeking), which then might lead to another round of information sharing and seeking (Savolainen, 2019).

2.3. Multi-actor service ecosystems

A multi-actor service ecosystem is "a relatively self-contained, self-adjusting system of resource integrating actors connected by shared institutional arrangements and mutual value creation through service exchange" (Vargo & Lusch, 2016, pp. 10–11). As evidenced by the growing body of literature on this topic, research investigating service encounters has progressed from the focus on dyadic customer-service-provider interactions, toward interactions in multi-actor service ecosystems (e.g., Chen, Chen, Zhan, & Sharma, 2020; Datta, 2020; Hartmann, Wieland, & Vargo, 2018; Ho, Chung, Kingshott, & Chiu, 2020; Holmqvist, Wirtz, & Fritze, 2020; Iden, Eikebrokk, & Marrone, 2020; Pathak, Ashok, & Tan, 2020; Pinna, De Simone, Cicotto, & Malik, 2020). In an increasingly networked environment, it has become important to focus on the "intersection of the digital, physical and social realms" (Bolton et al., 2018, p. 776) of the customer experience, instead of investigating these realms in isolation.

3. Theoretical background and hypotheses development

3.1. Value, attitude and behavior in multi-actor service ecosystems

In order to answer the question of whether gamification can be used to encourage customers' information exchange behavior, it is necessary to understand the causal chain that leads to the desired outcome. Prior research suggests that behaviors are generally driven by customers' attitudes toward a company (Bergel, Frank, & Brock, 2019; Petersen, Kumar, Polo, & Sese, 2018), and specifically for information management there is evidence that a customers' knowledge sharing attitude may influence information seeking behavior and information sharing behavior (Yang, 2008). However, gamification research thus far has not yet investigated the relationship between gamified experiences, customer' attitudes, and the subsequent influence on customers' behavior (Koivisto & Hamari, 2019). To understand how an experience stemming from gamification affects a customers' knowledge sharing attitude and his or her information seeking and sharing behavior, we draw upon the value-attitude-behavior (VAB) model, as others have before us (e.g., Hansen, 2008; Kang, Jun, & Arendt, 2015; McCarty & Shrum, 1994; Shamim, Ghazali, & Albinsson, 2017; Shim & Eastlick, 1998; Vaske & Donnelly, 1999). According to this framework, values have a direct as well as an indirect influence on behavior (Homer & Kahle, 1988), while attitudes play a mediating role between values and behaviors (Jayawardhena, 2004; Kautish & Sharma, 2019; Razali, Anuar, & Ngah, 2021; Shamim et al., 2017; Shim & Eastlick, 1998).

3.2. Value of gamified experiences in multi-actor service ecosystems

Recent gamification research has pointed out that "researchers and managers risk missing performance-relevant aspects if they only consider experiences in isolation" (Wolf et al., 2020, p. 354), and multi-actor service ecosystems, in particular, are largely characterized by interactions occurring among groups of actors simultaneously experiencing a given environment. Hence, it is necessary to investigate gamified experiences in multi-actor service ecosystems, holistically. As previously mentioned, gamification can be used to enhance a service and support actors in the value co-creation process (Huotari & Hamari, 2017), and that the value derived via "interactions involving either the direct usage or [indirect observation] of goods or services" (Mathwick, Malhotra, & Rigdon, 2001, p. 41) can be captured through experiential value. Therefore, we focus our attention on the experiential value derived through a gamified experience in a multi-actor service ecosystem. This value must account for customers' interactions with the gamified physical environment, their personal interactions with employees, and interactions among participating customers.

Mathwick et al. (2001) developed a four-dimensional scale comprising aesthetics, playfulness, service excellence and customer return on investment. The scale was tested and validated in a catalog and internet shopping context. However, while this experiential value scale is probably the most widely used, it has been argued that due to its context-specificity, it is not sufficient to capture experiential value in multi-actor service ecosystems (Weretecki, Greve, & Henseler, 2021). There is compelling evidence that the four-dimensional experiential value scale (EVS) needs to be adjusted, depending on the context.

For instance, aesthetics, in the EVS, are limited to visual appeal and entertainment-related factors (Mathwick et al., 2001). There is evidence that visual, acoustic, haptic and olfactory elements are significantly relevant (Wiedmann, Labenz, Haase, & Hennigs, 2018) in terms of the overall experience and therefore should be addressed within a marketing concept. Furthermore, service excellence reflects customers' general assessment of the performance displayed by the service provider (Mathwick et al., 2001), but it neglects the functional value of the contact personnel within a service ecosystem. Sánchez, Callarisa, Rodríguez, and Moliner (2006) also provided evidence for the relevance of the professionalism of contact personnel in multi-actor service ecosystems. Finally, due to its context, the EVS does not account for the impact of other customers on experiential value. Brocato, Voorhees, and Baker (2012) found evidence for the relevance of the other customer perception (OCP) dimensions "similarity" to other customers, the "physical appearance" and "suitable behavior" of other customers in a multi-actor service ecosystem.

3.3. Knowledge sharing attitude in multi-actor service ecosystems

Knowledge sharing revolves around the exchange of existing and subsequent creation of new knowledge between at least two parties (van den Hooff & de Ridder, 2004). Hence, knowledge sharing (KS) behavior consists of both providing and receiving knowledge. KS is not performed regularly or habitually, so research has investigated ways to motivate and encourage individuals to engage in the process (Cabrera & Cabrera, 2005; Pereira & Mohiya, 2021; Razmerita, Kirchner, & Nielsen, 2016).

Social exchange theory suggests that individuals will engage in knowledge sharing with others with the expectation of a benefit being received in return for their participation, and individuals tend to perform behaviors where they are able to maximize benefits and minimize their costs (Blau, 1964). Self-determination theory posits that behaviors can be extrinsically and/or intrinsically motivated (Ryan & Deci, 2020). In contrast to extrinsic motivation which is triggered by external benefits, e.g., rewards or being appreciated by others (Lee, Cheung, Lim, & Ling Sia, 2006), intrinsic motivation refers to the drive of doing an activity for the "inherent satisfactions" (Ryan & Deci, 2020, p. 2) it provides. According to the analysis of Lee et al. (2006), effort, time, and

a lack of reward are the key barriers inhibiting customer knowledge sharing while enjoyment and fun of helping others induces KS behavior. There is also evidence from information science that intrinsic motivational variables such as enjoyment positively influence knowledge sharing attitude (Lin, 2007) and actual knowledge sharing behavior (Phung, Hawryszkiewycz, Chandran, & Ha, 2019). Developing similar experiences as the ones created by games (e.g., sense of enjoyment, flow, autonomy) so that individuals engage with the system simply for the sake of using it, is at the core of information systems gamification tactics (Koivisto & Hamari, 2019). Therefore, this study hypothesizes the following:

H_1. : The experiential value of a gamified experience in a multi-actor service ecosystem positively influences customers' knowledge sharing attitude.

Although the discussion about the exact link between attitude and behavior has varied dramatically and has certainly become more nuanced over the years, the existence of a relationship between attitude and behavior remained undisputed (Guyer & Fabrigar, 2015). Research has discussed (the lack of) a direct relationship between both constructs (Wicker, 1969), one that is mediated by intention (Fishbein, Ajzen, & Fishbein, 1975) and one where the perceived behavioral control plays and important part for the relationship (Ajzen, 1991). However, to date none of the before mentioned models was able to prevail over the others and the value-attitude-behavior model is still up-to-date and frequently used (e.g., Cheung & To, 2019; Shin, Moon, Jung, & Severt, 2017).

Prior research has not only demonstrated the positive effect of knowledge sharing attitude on the intention to share information (e.g., Allam, Bliemel, Ali-Hassan, Blustein, & Spiteri, 2020; Bock, Zmud, Kim, & Lee, 2005; Gvili & Levy, 2021; So & Bolloju, 2005), but it also has investigated the direct relation between knowledge sharing attitude and knowledge sharing behavior. For example, Ryu, Ho, and Han (2003) found evidence of a significant effect of knowledge sharing attitude on knowledge sharing behavior, and Ng (2020) discussed the importance of trust for the direct relation between knowledge sharing attitude and knowledge sharing behavior. Additionally, Shamim et al. (2017) argued that customers with a positive knowledge sharing attitude are more likely to actually share information with others. Therefore, this study hypothesizes that:

H_2. : Customers' knowledge sharing attitude in a multi-actor service ecosystem positively influences customers' information-sharing behavior.

Furthermore, Shamim et al. (2017) also posit that customers with a positive attitude toward knowledge sharing are more likely to seek information from others. One possible explanation for this relationship is customers expectation of reciprocity. Research has provided evidence that expected reciprocity has an influence on the intention to share knowledge (e.g., Endres & Chowdhury, 2013; Hau, Kim, Lee, & Kim, 2013) as well as the quality and quantity of the knowledge sharing behavior (Chang & Chuang, 2011). Kang, Kim, and Bock (2010) provided evidence for the influence of reciprocity on knowledge transfer in dyadic situations. Based on this, the current study assumes that customers expecting to receive valuable information in return for their knowledge sharing, i.e., provision of information, also have a positive knowledge sharing attitude. Furthermore, it is assumed that customers expecting reciprocity must have unmet information needs themselves, otherwise they would not value the provision of information by others. Hence, it is not unreasonable to assume a positive relationship between knowledge sharing attitude and information seeking behavior. Therefore, this study hypothesizes that:

H_3. : Customers' knowledge sharing attitude in a multi-actor service ecosystem positively influences customers' information-seeking behavior.

3.4. Information exchange behavior in multi-actor service ecosystems

As already pointed out, information-seeking, respectively, the information received through the activity, is important to customers because it enables them to successfully co-create value with other actors of the ecosystem (Yi & Gong, 2013). Information-sharing behavior includes the provision of information to other actors and confirming that the recipient(s) has (have) received and understood that information (Sonnenwald, 2006). Information-sharing is key to successful value co-creation as customers can ensure that the service they receive matches their individual needs (Ennew & Binks, 1999; Yi & Gong, 2013).

Similar to games, gamification aims for customers to feel positive emotional arousal and develop a need for social comparison or for bonding with others (Koivisto & Hamari, 2019). Bardi and Schwartz (2003) found evidence that stimulation values (e.g., excitement and novelty) relate strongly to the behaviors that express them. Furthermore, hedonism (e.g., pleasure, sensuous gratification), power (e.g., status, prestige) and universalism (e.g., understanding, social justice) relate at least moderately (Bardi & Schwartz, 2003). Studies show that gamified experiences can influence participation behavior (e.g., information exchange behavior) in terms of the quantity and/or quality of the contributions (e.g., Barata, Gama, Jorge, & Gonçalves, 2013; Choi, Choi, So, Lee, & You, 2014).

Successfully gamified experiences can increase human motivation to participate in interaction with others and engage in knowledge sharing behavior (Friedrich, Becker, Kramer, Wirth, & Schneider, 2020). With regards to the influence of gamified experiences on information sharing behavior, research already has provided evidence that successfully gamified experiences increase the information sharing on digital platforms, between employees (e.g., Press, 2013; Silic & Back, 2017; Suh & Wagner, 2017), between students in a learning community (Moccozet, Tardy, Opprecht, & Leonard, 2013), between customers in online Q&A communities (Li, Huang, & Cavusoglu, 2012), and also in dyadic relationships between guests and hosts in the context of online reviews for vacation rentals (Liang, Schuckert, Law, & Chen, 2017). This study assumes that this effect is neither exclusive to the virtual world, nor to dyadic relationships, and therefore hypothesizes that:

H_4. : The experiential value of a gamified experience in a multi-actor service ecosystem positively influences customers' information-sharing behavior.

As stated earlier, the infusion of gameful affordances into a non-game context is frequently used by companies to change customers perceptions of certain "tasks". The goal is to deliver experiences like those created through games (i.e., make something fun that formerly was mostly conceived as boring, stressful and/or exhausting). Pe-Than, Goh, and Lee (2014), for example, argue that the enjoyment and entertainment provided through game mechanics can facilitate information seeking behavior. Additionally, Xu, Tian, Buhalis, Weber, and Zhang (2016) stressed the relevance of information accuracy in game design as tourists were found to play games as part of their purposive information-seeking activities, and Seiffert-Brockmann, Weitzl, and Henriks (2018) concluded that successfully gamified experiences even have the potential to influence information seeking behavior for customers who entirely "lack the interest and motivation for information seeking". Therefore, this study hypothesizes that:

H_5. : The experiential value of a gamified experience in a multi-actor service ecosystem positively influences customers' information-seeking behavior.

We expect that (in line with the VAB model) knowledge sharing attitude mediates between the experiential value of the gamifies experience and the behavior. The five hypotheses are depicted in Fig. 1.

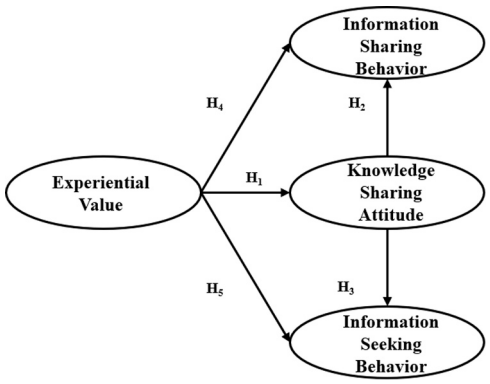

Fig. 1. Conceptual model.

4. Research methodology

4.1. Measures

The measurement for the value must account for customers' interactions with the gamified physical environment, their personal interactions with employees and interactions between customers. Therefore, we used the experiential value scale for multi-actor service ecosystems, which is based on the functional value of personnel (professionalism), the perception of other customers' appearance (similarity), the perception of other customers' behavior (suitable behavior), multisensory stimuli (sensory appeal) and customers' enjoyment (playfulness) (Weretecki et al., 2021). Professionalism, the functional value of the contact personnel, is measured by four items loading on a single factor (Sánchez et al., 2006). Professionalism value may be interpreted as the value that customers derive from a personal interaction experience based on perceived knowledge, competence, and valuableness of information. Similarity reflects the degree customers feel similar and can relate to other customers in the service ecosystem (Brocato et al., 2012). Customers seek social support from others who are in a similar situation. Social support is most effective when it is offered by actors who can relate because they went through the same experience(s) (Hanks, Zhang, & Line, 2020). Suitable behavior of other customers is judged (by their peers) based on what is considered to be appropriate within the context of the service ecosystem (Brocato et al., 2012). Other customers' behaviors can have tremendous influence on a customers' experience as it has been shown to influence the level of expectation, set social rules, function as a standard for comparison, entertain and helps participation (Camelis, Dano, Hamon, & Llosa, 2017). Sensory appeal relates to the influence of the multisensory environment (olfactory, acoustic, haptic, and visual stimuli) on the experiential value. Addressing multiple senses simultaneously and in a coordinated way, can influence the customer's experience positively (Soars, 2009). Playfulness refers to the customers' enjoyment that comes from engaging in entertaining activities. Furthermore, escapism is the aspect of playfulness that allows the customer to temporarily escape daily routine. Prior research has reported the importance of entertainment and escapism for experiential value (e.g., Keng, Huang, Zheng, & Hsu, 2007; Mathwick et al., 2001). The scale was developed and validated in a multi-actor service ecosystem and the items used to measure experiential value are based on a unique combination of prior literature on experiential value in the fields of service marketing, brand management, retail, and tourism management.

Customer's knowledge sharing attitude is part of the customer value co-creation attitude and therefore can be measured using that scale (Shamim et al., 2017). Knowledge sharing attitude is measured by three items loading on a single factor.

As pointed out, both the information-seeking and information-sharing behavior are required for successful value co-creation in multi-actor service ecosystems. This required participation by the customer can be measured using the customer value co-creation behavior scale (Yi & Gong, 2013). Information-seeking is measured by three and information sharing by four items each loading on a single factor.

Table 1 provides an overview of all the constructs and measurements.

4.2. Data collection procedure

The customer survey was conducted at IFA 2018, the world's leading experiential event for consumer electronics and home appliances. The multi-actor service ecosystem was gamified through a combination of achievement/progression-oriented, social-oriented, immersion-oriented and real world-related affordances. After initial registration, customers received a personalized link on their cellphone, leading them to their personal badgebook which displayed their virtual identity including chosen username, collected points, achievements, and additional performance stats. Depending on their performance (visible leaderboards) in the challenges and competitions against other actors and computer programs, customers had the chance to win real world prizes.

Gamification at this event was primarily used to have customers experience and learn more about new 5 G technologies in a socially interactive, innovative, and fun way. For example, a multiplayer drone race was developed to allow customers a playful way to experience the advantages of a 5 G network. Up to five players at a time were able to fly a customized/personalized drone through a futuristic city, all while being displayed on a 4.5 × 6.0-meter LED wall (Demodern, 2018). Players flew through four different environments, collecting power-ups based on 5 G features such as speed, latency, coverage, and capacity, which added variation to game rhythms and influenced player performance while making salient the technological advantages of 5 G (Demodern, 2018). Players received badgebook points for their performance within the game, but they decided on their own whether to behave competitively or cooperatively during the game experience. On average, customers used gamification for 16.6 min.

Customers of the experiential event were intercepted and screened for appropriateness after their visit, near the exits of a 5000 square-meter experience area. The qualifying criteria for the participants required active participation and interaction with the experiential offerings. Computer-Assisted Self-Interviewing, respectively, a standardized questionnaire with seven-point Likert scales (1 = strongly agree, 7 = strongly disagree) was used. Data were collected from August 31 to September 5, 2018.

5. Results

A total of 468 valid completed questionnaires were obtained from 632 qualified respondents, representing a valid response rate of more than 74%. The decision to discard some of the filled questionnaires was based on obvious outliers and incomplete answers. As shown in Table 2, we have collected more valid responses from males (66.8%) than from females (33,2%). The primary respondents (64,7%) were between 16 and 39 years old, while respondents in their twenties constituted for about 34,3%. Most of the respondents were either fulltime or parttime employed (71.5%) and had either a high school degree (41%) or a degree from a university (41.9%).

5.1. Measurement model

Prior to the investigation of the structural model, confirmatory factor analysis (CFA) was conducted applying the software AMOS v.25. Full information maximum likelihood was employed as an estimator owing to its favorable statistical properties such as consistency, unbiasedness, and efficiency (Henseler, 2021). There was no reason to switch to estimators with inferior statistical properties (such as unweighted least

Table 1
Overview of constructs and measurements.

Construct	Dimension	Sub-dimension	Items
Experiential Value			
	Playfulness[1]	Escape	The experience of XYZ "gets me away from it all".
			I get so involved that I forget everything else.
			The experience makes me feel like I am in another world.
		Entertainment	The enthusiasm of the XYZ is catching, it picks me up.
			XYZ doesn't just sell products–it entertains me.
	Service Excellence[1]		When I think of XYZ, I think of excellence.
			I think of XYZ as an expert in the merchandise it offers.
	Customer Return-on Investment[1]	Efficiency	Shopping from XYZ is an efficient way to manage my time.
			Shopping from XYZ makes my life easier.
			Shopping from XYZ fits with my schedule.
	Functional value of personnel[2]	Professionalism	The personnel knew their job well.
			The personnel knew their products.
			The personnel's advice was valuable.
			The personnel were good professionals and they were up-to-date about new items and trends.
	Sensory-Appeal[3]	Olfactory	The interaction area smells very nice.
			The scent of the interaction area is very pleasant.
			The fragrance of XYZ is very appealing.
		Acoustic	The music of XYZ is very nice to listen to.
			The sound scape of XYZ is very pleasant.
		Haptic	The materials of XYZ feel absolutely good.
			The furnishings of XYZ are very nice to touch.
		Visual	XYZ is visually appealing.
			The way the company displays XYZ is appealing.
	Other Customer-perception[4]	Similarity	The other patrons are like me.
			I could identify with the other patrons in the facility.
			I liked the appearance of the other patrons.
			I am similar to the other patrons in the facility.
			The other patrons looked nice.
		Suitable Behavior	I found that the other patrons behaved well.
			Other patrons' behavior was appropriate for the setting.
			The other patrons' behavior was pleasant.
			The other patrons were dressed appropriately.
			The other patrons were friendly towards me.
Customer participation Behavior[5]	Information-Seeking behavior[5]		I have asked others for information on what this service offers.
			I have searched for information on where this service is located.
			I have paid attention to how others behave to use this service well.
	Information-Sharing behavior[5]		I clearly explained what I wanted the employee to do.
			I gave the employee proper information.
			I provided necessary information so that the employee could perform his or her duties.
			I answered all the employee's service-related questions.
Customer value co-creation attitude[6]	Knowledge Sharing attitude		I like to share knowledge with service providers.
			I like to involve in dialog for knowledge sharing when service providers take initiative.
			I am more attracted to involve in dialog for sharing knowledge with service employees who are uninformed.

[1]Mathwick et al. (2001); [2]Sánchez et al. (2006); [3]Wiedmann et al. (2018); [4]Brocato et al. (2012); [5]Yi & Gong (2013); [6]Shamim et al. (2017).

Table 2
Demographic profile of the sample.

Variable	Characteristics	%
Age	16–19 years	15.2
	20–29 years	34.3
	30–39 years	15.2
	40–49 years	12.7
	50–59 years	13.6
	60–65 years	5.1
	66 years and older	3.9
Gender	Female	33.2
	Male	66.8
Education	High School	41.0
	University	41.9
	Without higher education	17.1
Occupation	Full time/part time	71.5
	Unemployed	28.5
Occupation (if unemployed)	Pupil	29.5
	Student	34.5
	Pensioner	25.9
	Housewife/husband	3.6
	Other	6.5

N = 468.

squares, partial least squares, or generalized structured component analysis) or to more demanding estimators (such as asymptotic distribution-free).

The constructs used for the CFA, including the higher order experiential value, are depicted in Table 1. The CFA achieved acceptable fit (SRMR =0.06, NFI =0.89, IFI =0.94, CFI =0.94, RMSEA =0.05, CMIN/DF = 2.064). The validity and reliability of the constructs have been assessed. Convergent validity was assessed based on the average value extracted (AVE), with a recommended cut-off of .5 (Hair, Black, Babin, & Anderson, 2018). As an exception to this rule, convergent validity may also be concluded in cases of an AVE below.5 but with composite reliability (Fornell & Larcker, 1981). Discriminant validity was evaluated by checking whether the AVE of each construct was greater than the inter-construct correlations (Hair et al., 2018). Composite Reliability (CR) was used to evaluate internal consistency, with a threshold of 0.7 for the CR values. The reliability for each construct was assessed based on Cronbach's a. As evidenced by Table 3, the model is valid and reliable.

Like other behavioral research, in particular research that is based on self-reported data by the respondents, there is a potential of a common method bias. As suggested by Podsakoff, MacKenzie, Lee, and Podsakoff (2003), this study addressed this potential issue prior and during the data collection through procedural remedies (e.g., ensuring respondents of anonymity, counterbalancing question order, reduction of item ambiguity etc.). Afterwards, Harman's single-factor test was conducted. The results indicated that bias is not a major issue in our case, as the percentage of explained variance explained by one factor was 39.5%, which is below the recommended threshold of 50%. In summary, while it is not possible to remove common method bias completely, it has been controlled for in this study adequately.

5.2. Structural model

The structural model was tested. The overall model fit was almost identical to the model fit of the measurement model and therefore satisfactory. The model resulted in a chi-square statistic ($\chi^2 = 1205$, df = 579) and acceptable fit indices (SRMR =0.06, NFI =0.89, IFI =0.94, CFI =0.94, RMSEA =0.05).

After the overall model fit was approved, hypotheses were tested via structural equation modeling. The structural equation model's standardized path coefficients were used to evaluate the hypotheses (see Fig. 2).

H_1 predicts that the experiential value of a gamified experience in a multi-actor service ecosystem positively influences customers' knowledge sharing attitude. As presented in Table 4, the hypothesis is strongly supported. The standardized path coefficient between experiential value and knowledge sharing attitude is $\beta = 0.71$, CR = 11.87 and $p < .001$.

H_2 predicts that the customers knowledge sharing attitude in a multi-actor service ecosystem positively influences customers' information-sharing behavior. As presented in Table 4, the hypothesis is strongly supported. The standardized path coefficient between customers knowledge sharing attitude and customers' information sharing behavior is $\beta = 0.29$, CR = 3.31 and $p < .001$.

H_3 predicts that the customers' knowledge sharing attitude in a multi-actor service ecosystem positively influences customers' information-seeking behavior. As presented in Table 4, the effect is not significant and therefore the hypothesis is not supported. The standardized path coefficient between customers' knowledge sharing attitude and customers' information-seeking behavior is $\beta = 0.29$, CR = 3.31 and $p < .001$.

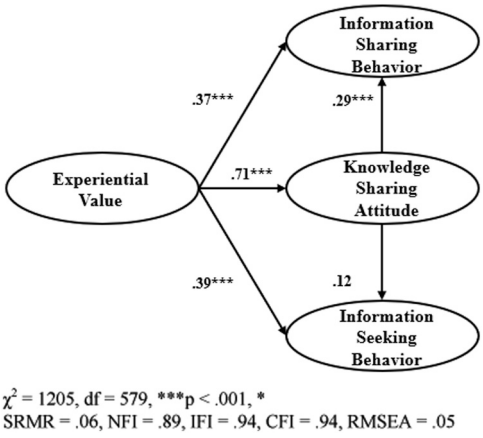

Fig. 2. Results of the structural equation model.

H_4 predicts that the experiential value of a gamified experience in a multi-actor service ecosystem positively influences customers' information-sharing behavior. As presented in Table 4, the hypothesis is strongly supported. The standardized path coefficient between experiential value and information-sharing behavior is $\beta = 0.37$, CR = 4.39 and $p < .001$.

H_5 predicts that the experiential value of a gamified experience in a multi-actor service ecosystem positively influences customers' information-seeking behavior. As presented in Table 4, the hypothesis is strongly supported. The standardized path coefficient between experiential value and information-seeking behavior is $\beta = 0.39$, CR = 3.82 and $p < .001$.

Research has pointed out that "the main feature of the VAB model is its emphasis on the mediating role of attitudes [between] values and behaviors" (Milfont, Duckitt, & Wagner, 2010, p. 2792). Several other researchers have reported findings of this feature (e.g., Cai & Shannon, 2012; Jayawardhena, 2004; Shamim et al., 2017; Shim & Eastlick, 1998). Against this background and considering that both H_1 and H_3 have been supported, point in the same direction and are significant, we suspect that knowledge sharing attitude mediates the relationship between experiential value and information-sharing behavior. The indirect effect of experiential value on and information-sharing behavior must be significant to establish the mediation effect. We performed a bootstrapping procedure with 2000 bootstrap samples and used the 90% bias-corrected confidence level. The results of the analysis revealed a significant indirect effect of experiential value on information-sharing behavior via knowledge sharing attitude ($\beta = 0.293$, $p = .005$), supporting partial mediation of knowledge sharing attitude. The mediated effect (a x b) and the direct effect (c) point in the same direction, indicating complementary mediation (Zhao, Lynch, & Chen, 2010). The total effect, direct effect and the indirect effect are presented in Table 5.

Table 3
Mean, SD, Cronbach's alpha (α), CR, AVE, correlations, and the square root of AVE for study constructs.

Dimension	Mean	SD	α	CR	AVE	Knowledge Sharing Attitude	Information-Seeking Behavior	Experiential Value	Information-Sharing Behavior
Knowledge Sharing Attitude	2.25	0.94	.713	.763	.618	**.786**			
Information-Seeking Behavior	2.28	1.40	.641	.755	.488	.381**	**.623**		
Experiential Value	2.42	1.18	.856	.880	.598	.713**	.459**	**.773**	
Information-Sharing Behavior	2.78	1.47	.832	.778	.540	.554**	.460**	.574***	**.735**

***p < .001.

Table 4
Hypothesis testing results.

Hypotheses	Independent variable		Dependent variable	Path Coefficient	S.E.	CR	p	Remarks
H_1	Experiential Value	→	Knowledge Sharing Attitude	.71	.070	11.871	.001	Supported
H_2	Knowledge Sharing Attitude	→	Information-Sharing Behavior	.29	.107	3.309	.001	Supported
H_3	Knowledge Sharing Attitude	→	Information-Seeking Behavior	.12	.165	1.198	.231	not sig.
H_4	Experiential Value	→	Information-Sharing Behavior	.37	.120	4.388	.001	Supported
H_5	Experiential Value	→	Information-Seeking Behavior	.39	.190	3.818	.001	Supported

6. Discussion

The aim of this study was to investigate whether experiential value generated through a gamified experience in a multi-actor service ecosystem can be used to encourage customers' information exchange behavior. Furthermore, our research had the goal to examine the impact of customers' knowledge sharing attitude on the relationship between experiential value of a gamified experience and customers' information exchange behavior. We applied structural equation modeling to achieve this objective, and we believe our study has augmented the literature on gamification and multi actor ecosystems in a number of ways.

First, this study makes a substantial contribution regarding the characteristics that precede the effects of gamification on customer behavior. Prior research already has demonstrated the moderating role of demographic factors (e.g., Bittner & Schipper, 2014; Koivisto & Hamari, 2014) and the relevance of certain personality traits (Butler, 2014), however, to our knowledge this is the first study that has investigated attitude as a predecessor of the effects of gamification. This is important for several reasons. For one, it is highly unlikely to achieve maximum efficiency of gamification without a clear understanding of both consequences and antecedents. Additionally, it has the potential to put a new spin on prior findings. For instance, maybe it is not demographics that moderate the effects of gamification, as suggested by Bittner and Schipper (2014), but rather that certain attitudes occur more often within some demographic groups.

Second, this study investigated a gamified experience that had the goal of stimulating engagement among large groups of people with widely varying characteristics and backgrounds. As evidenced by Table 2, the demographic profile of the sample was very diverse. Interestingly, neither the organizer of the event nor the researchers saw any significant variance among the answers of members of different demographic groups. After conferring with the organizer of the event we traced this back to the following three reasons. First, all gamified experiences were kept simple in terms of handling and necessary prior (technical) knowledge. The goal was to deliver experiences with low barriers to entry. Second, the possibility of winning real world prizes seemed to appeal to all customers. Third, while the experiential event attracted customers with different characteristics and backgrounds from all over the world, all of them likely shared a common interest for innovations in consumer electronics. Therefore, it is certainly a possibility that a shared common interest among customers is more important for successful gamification than similarities in demographic backgrounds.

Third, this study aimed to identify a consistent and validated measurement instrument that can be applied to (any) gamified experiences. This is highly relevant, as it enables researchers to compare research results despite differences in context, industry, or implementation (Koivisto & Hamari, 2019). Although the implementation of gamification tactics can vary greatly, the experiential value they create is the common goal among them. Considering that there already exists a scalable measurement instrument that can be applied to gamified experiences ranging from simple customer-interface interactions, all the way up to multi-actor service ecosystems, we believe this avenue is worth pursuing.

Table 5
Mediation effects (Bootstrapping Results).

Variables	Total effect (ab+c)	Direct effect (c)	Indirect effect (ab)	Result
Experiential Value-Knowledge Sharing Attitude-Information Sharing Behavior	β = 0.667 p = .001	β = 0.374 p = .001	β = 0.293 p = .005	Partial Mediation Supported

6.1. Theoretical contribution and implications

As described above, this study makes several contributions. However, we feel that there are two specific theoretical contributions which are especially relevant, as they pave the way for future research.

First, in order to understand how an experience stemming from gamification affects a customers' knowledge sharing attitude and his or her information seeking and sharing behavior, we drew upon the value-attitude-behavior model. To our knowledge, this is the first study to ever apply the VAB model in the gamification context. Our results indicate that it certainly fits the intended purpose. That is good news for gamification researchers, as it provides a possible approach toward unlocking more of the mechanics of successful gamification applications.

Second, this study found that knowledge sharing attitude mediates the relationship between experiential value and information-sharing behavior. At the same time, we identified a complementary mediation effect in our proposed model. The significant direct effect of experiential value on information-sharing behavior "points to the possible existence of some omitted second mediator" (Zhao, Lynch, & Chen, 2010, p. 201). Therefore, we not only provided first evidence for the importance of attitude (in general) as an antecedent to the effects of gamification, but our findings also suggest that there may be additional mediators (i.e., other attitudes) worth looking into.

6.2. Implications for practice

The experiential value of a gamified experience positively influences both the customers' information sharing and information-seeking behaviors. This direct influence on customers' information exchange behavior will be particularly interesting to managers as our findings support the notion that gamification may be used to foster information exchange and value co-creation between customers and employees directly, without necessarily having to change customers' attitudes first. This probably will result in gamification becoming even more attractive to managers as it seems like an easy way to influence such an important customer behavior. However, such expectations need to be tempered somewhat as our investigation also revealed that customers' knowledge sharing attitudes precede information-sharing behavior. Additionally, we find that knowledge sharing attitude mediates the relationship between experiential value and information sharing behavior. Hence, managers need to be aware that there also is a significant indirect effect on information sharing behavior to be considered. This should encourage development of gamified experiences that extend beyond entertainment and stimulate conversation among actors. For example, in our study, the gamification context embedded content related to 5 G technologies. This allowed for participants to not only increase

individual knowledge, but also consider relevance of 5 G capabilities to their own lives. This allows the customer to know what questions to ask or experiences to share and can ultimately increase the capability of value co-creation.

Secondly, our findings suggest that gamification can be applied in cases of large groups of people with widely varying characteristics, backgrounds, and motivations. Applying the experiential value scale for multi-actor service ecosystems revealed that in such a case, a customer's perception of the other actors of the ecosystem (employees and other customers) has a significant influence on the overall experiential value of the gamified experience. This is of high importance to management. In cases of gamification deployed in the virtual world (e.g., websites or apps), other actors largely stay anonymous. However, in real world multi-actor service ecosystems, all participants, their behaviors, and their characteristics are directly visible to other participating actors. Therefore, actors within this environment will influence one another's perceptions and impact the potential customer experiential value. Managers need to be made aware of this important difference between gamification in the virtual world and in multi-actor service ecosystems before executing on any gamification strategies. Thus, strategies should extend beyond game mechanics to also include game administration and training of employees to promote consistency within the customer experience.

6.3. Limitations and future research direction

This study is the first to apply a holistic experiential value approach to a gamified experience that simultaneously accounts for customers' interactions with a multisensory physical environment, their personal interactions with employees, and their interactions with other customers. It succeeds in answering the question whether gamified experiences in a multi-actor service ecosystem can be used to encourage customers' information exchange behavior, and it successfully investigates the impact of customers' knowledge sharing attitude on the relationship between experiential value and customers' information exchange behavior. However, it is not without its limitations.

Information exchange between different actors (e.g., between customer and employee) is certainly necessary, however, providing "the 'right' information, at the 'right' time, in the 'right' place, in the 'right' way, to the 'right' person" (Fischer, 2012, p. 1) is far more important than sheer information quantity. After all, what good does increased information (quantity) do, if it is lacking the aforementioned qualities? Therefore, future research should also focus on the quality of the exchanged information in gamified multi-actor service ecosystems. A comparison between the information quality of "naturally" occurring information exchange versus the one fostered through a gamified experience would certainly be very interesting.

As indicated, the multi-actor service ecosystem in this study was gamified through a combination of achievement/progression-oriented, social-oriented, immersion-oriented, and real world-related affordances. Based on the results of our study, we believe that it is safe to say that the affordances have been combined successfully. However, our results do not allow conclusions on the relevance of individual affordances or their manifestations (e.g., cooperatively vs. competitively) for different actor groups. Considering that the drivers of behaviors can (depending on the actor) be diverse (Koivisto & Hamari, 2019), future research could also investigate if certain affordances are more suitable to influence certain actor groups than others.

This study investigated a gamified experience at an experiential event in the electronics industry. The nature of the event allowed for a large and immersive audio/visual experience within a context that participants were exposed to other entertainment and experiential displays and encounters. While we believe our findings are robust, in order to generalize our research, it necessary to look into other (less experience and entertainment focused) contexts and industries. It would be interesting to see if a gamified experience such as in our study would elicit different effects when encountered as a more novel engagement outside of other gamified efforts.

7. Conclusions

This study's starting point, was a general question: Information management can't be all fun and games, can it? As the title of the paper indicates, it might be hard to believe that something rather important, such as information management, could go along with something rather insignificant, such as games or game like experiences. To answer the question, this research investigated whether gamified experiences can be used to encourage customers' information exchange behavior. We believe, they can. Even in cases of large groups of people with widely varying characteristics, backgrounds, and motivations.

However, we feel that this is only half the story. From our perspective, the real challenge for businesses will not be the design of gamified experiences that foster information exchange between the actors in multi-actor service ecosystems, the challenge is to ensure that the actors still provide the right information, at the right time, in the right place, in the right way, and to the right person. Against this background, our initial question should be best answered as follows: Information management can be all fun and games, as long as all quality attributes of information exchange are adhered to.

CRediT authorship contribution statement

Patrick Weretecki: Conceptualization, Methodology, Investigation, Writing – Original draft, Writing- Review & Editing. **Goetz Greve.**: Methodology, Validation, Formal analysis. **Kenneth Bates**: Writing – Original draft, Writing – Review & Editing. **Jörg Henseler**: Writing – Review & Editing, Supervision.

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