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Online Value Creation Behavior of ŌURA Ring Users and Service Quality Evaluation

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Abstract

Users' interaction in virtual communities, can co-create and co-destruct value and greatly influence users' perception of service quality. We explored the online value creation behavior of ŌURA Ring (a self-monitoring device) users by focusing on customer-to-customer (C2C) interaction. This study presented one of the initial conceptual frameworks for examining online value creation behavior in the context of self-tracking technologies. AMOS and fsQCA were applied for relationship testing. The findings demonstrated that when value co-creation (VCC) and value co-destruction (VCD) occur concurrently, the existence of perceived functional value (PFV) and perceived hedonic value (PHV) is required for users to have a favorable service quality experience. In addition, PFV was validated as the most essential component for favorable PSQ. The proposed conceptual model can guide self-tracker providers in determining how to join and promote C2C interactions in the virtual community to enhance consumers' PSQ.

Keywords: Value co-creation, Value co-destruction, Service quality, Self-tracker technology, Social media

1. Introduction

Customer-dominant logic (CD logic) is a perspective that places the customer at the center rather than the service or the service provider (Heinonen et al., 2010). Thus, it is a different worldview, not a subset of a service-dominant logic that argues only engagement and collaboration between service providers and customers may create value (Vargo and Lusch, 2008). In other words, it is beneficial for businesses to concentrate on consumer engagement to acquire a better understanding of consumer experiences as a critical component of co-creating value (Hsu, 2017) besides other actor-to-actor interactions.

Customers and users communicate to share resources, including knowledge, ideas, and experiences, through social media (Libai et al., 2010). Prior research has underlined the necessity of customer-to-customer interaction in online communities for obtaining VCC (Shen et al., 2020), however, interactions in an online community may be both beneficial and detrimental and they do not always lead to the VCC (Plé and Cáceres 2010). A decline in well-being can result from improper interactions, which can cause members to lose resources such as time and energy and experience diminished perceived value (Järvi et al., 2018). For instance, a positive interaction might involve a user sharing a successful experience with using the device to improve health and well-being, with other users improved functional value perception, while a negative interaction could be an instance where a user provides inaccurate information about the device's features, leading to confusion among other community members and decreased value perception. VCD is the term coined for this failed interaction process (Järvi et al., 2018). Therefore, considering and clarifying VCD is as important as understanding VCC (Plé & Caceres, 2010; Li & Tuunanen, 2022).

The first gap in the literature is that although VCC has been investigated, little study has been undertaken on the potentially negative side effects of actor-to-actor interactions (i.e., Li & Tuunanen, 2022). The second gap is that previous research has primarily focused on VCC between customers and service providers (e.g. Winkler & Wulf, 2019) or both VCC and VCD (Lintula et al., 2018; Li & Tuunanen, 2022), but has neglected VCC and VCD by customer-to-customer (C2C) interactions (Heinonen et al., 2018). This gap should be addressed, as users in social media share their experiences, information, and ideas through interaction and impact on each other's perceived value (Heinonen et al., 2018). Therefore, positive, and negative C2C interactions serve as potential factors for value co-creation and value co-destruction (Rihova et al., 2018). Additionally, an extensive literature review indicated that positive or negative perceived value by users may result in service quality perception (Akram et al., 2019; Zhou et al., 2014).

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The following questions were addressed by the researchers: How do C2C interactions (positive and negative) impact perceived social/ functional/hedonic values? How do such interactions shape users' perceptions of service quality? Our research objective is to analyze the value-creation behavior of ŌURA Ring users on social media as an online community. ŌURA Ring is a smart ring/sleep tracker that allows users to measure sleep quality, physical activity, and readiness scores (how the body is ready to perform the exercise) via an application. The data is collected from Ōura Ring users' Facebook groups. We employed structural equation modeling (SEM) and a configurational method known as fuzzy-set qualitative comparative analysis (fsQCA) aiming to gain complementary insight in addition to SEM findings.

The proposed approach and results can aid self-monitoring technology providers to understand how to participate in and promote C2C interactions in the virtual community to improve consumers' perceptions of service quality and address the problem when both VCC and VCD coincide on social media.

2. Background information

Value co-creation refers to a resource integration process between the provider and the customer (Vargo & Lusch, 2008). It implies that all the actors involved in the process act to benefit from the interaction (Grönroos, 2012). Research on online communities indicates that customers exchange resources in collective interaction, such as sharing experiences, entertaining, or supporting peers, and creating value for customers (e.g., Brodie et al., 2013). C2C interaction range from positive, such as problem-solving (Johnson et al., 2013) to negative behaviors, such as verbal misdemeanor (Zhang et al., 2010). Therefore, positive and negative C2C interactions are respective of favorable and unfavorable exchanges of resources. Thus, such interactions align with value co-creation and co-destruction during the service encounter.

Heinonen et al. (2018), demonstrated that C2C (positive and negative) interaction may have numerous consequences for users, including hedonic value perception (provoking pleasant feelings), social value perception (enhancing or degrading a user's social (interpersonal) status), and functional (utilitarian) value perception (increasing or degrading a user's ability to do a task). A favorable resource exchange will increase users' perceived value (Rosenbaum & Wong, 2010), meanwhile, an unfavorable exchange decreases the value perception. According to Laud et al. (2019), in the context of online communities, members who suffer a decline in well-being may have a negative perception toward service quality, and adversely, an increase in

well-being leads to improved service quality perception. Additionally, multiple parties have acknowledged that effective communication may enhance service, a vital element of value (Rosenbaum & Wong, 2010), and insufficient resource integration will impede service delivery.

3. Development of the theoretical model

Figure 1 demonstrates that the conceptual framework is an integrated model that combines three key information systems study domains. The first two investigated the positive and negative characteristics of C2C interactions in virtual communities and their impact on VCC and VCD outcomes (perceived values). The third domain investigated the impact of social media activity on service quality evaluations.

C2C interactions include both satisfied and dissatisfied behaviors (Johnson & Grier, 2013), and they may have numerous consequences for users, including hedonic, social and functional value perception (Heinonen et al., 2018). In the proposed integrated framework, we consider that pleasant and unpleasant online interactions influence the ŌURA Ring users' perceived values.

Moreover, according to social exchange theory, those who invest more effort in an activity, such as co-creating value, are motivated by the returns (Blau, 2017). For VCC, customers expect certain advantages. Customers who participate in co-creation via online communities expect pleasant experiences (joyful activities), product-related knowledge (opportunities to gain experience), and social value (opportunities to interact with others); Nambisan & Baron, 2009).

We also believe that inappropriate connections or unpredictable behaviors may result in negative resource integration, resulting in differences between expected and actual situations, VCD (Chowdhury et al., 2016), and a reduction in value outcomes. A decrease in perceived functional, social, and hedonic benefits indicates a loss in perceived value. It is, therefore, plausible to assert that declining value perceptions reflect a decline in "well-being" in interaction and destruction of value.

Regarding user perception, the conservation of resources theory postulates that humans use coping strategies to recover their well-being after exposure to situations that result in their decline (Laud et al., 2019; Smith, 2013). Avoidance behaviors refer to reactive coping mechanisms. Mental or behavioral avoidance may imply disengagement (Laud et al., 2019; Smith, 2013). Thus, consumers who suffer a decrease in their well-being in virtual communities may regard service quality negatively and prefer alternative services in the future.

This study empirically investigated the processes behind VCC and VCD for the above reasons. It examined the link between influential factors and the perceptions of VCC and VCD members during virtual community engagement. To this end, we designed a model (Figure 1). The following is an overview of the proposed model, pertinent literature, and hypotheses.
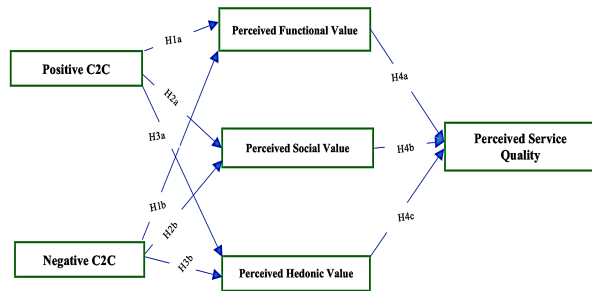
Figure 1. Conceptual framework

4. Hypothesis

4.1. Perceived functional (utilitarian) value

The functional value of virtual groups in social media stems from the interchange of information and ideas (Nambisan & Baron, 2009) which allows users to address known problems and achieve a sense of autonomy (Brodie et al., 2013). This allows users to acquire knowledge and expertise from the service providers and members of the community with whom they connect (Wang & Fesenmaier, 2004). When information is insufficient or of poor quality, users perceive less functional value and failed resource integration, which can result in VCD (Järvi et al., 2018).

C2C interactions may have both favorable and unfavorable value outcomes. If the information received from other members in online communities enables users to seek, explore, and utilize items or services in a manner that fulfills their standard needs, the functional value will improve (Nambisan & Baron, 2009). In contrast, VCD is typical in online communities. In such groups, undesirable interaction behaviors, such as offering false information or excessive interaction, impede other members' access to the most accurate information (Chang et al., 2020).

Therefore, the researchers proposed the following two hypotheses:

H1a: Positive C2C interaction has a positive effect on perceived functional value.

H1b: Negative C2C interaction has a negative effect on perceived functional value.

4.2. Perceived social (interpersonal) value

Users have several motives for joining online networks, including gaining social benefits (i.e., forming and establishing social interactions with other members; Luo et al., 2019). Perceived interpersonal values are the benefits that individuals gain from interpersonal activities, such as enhancing their social engagement, maintaining and constructing interpersonal relationships, and eliciting favorable reactions from other members (Zhou et al., 2014). Negative value perceptions are indicated by declines in perceived social values. Therefore, reductions in perceived social values may be taken as indications of a decrease in the interaction's "*well-being.*"

For example, customers participate in community formation, develop professional ties, and engage in pleasant contact, which can result in a sense of belonging and an increase in perceived social values. The social results of C2C contact may also be unfavorable (Heinonen et al., 2018) and can produce dissatisfaction, thereby diminishing the user's perception of social value (Kim & Yi, 2017).

The following hypotheses were proposed based on the concepts detailed in the preceding discussion:

H2a: Positive C2C interaction has a positive effect on perceived social values.

H2b: negative C2C interaction has a negative effect on perceived social values.

4.3. Perceived hedonic value

Customers' hedonic activity is stimulated by pleasurable interactions, and users' pleasure (Georgi & Mink, 2013). Personal enjoyment and happy emotions result from conversations with other consumers. Nonetheless, they can also trigger anxiety (Johnson & Grier, 2013) or unpleasant emotions such as unhappiness.

C2C connections and interpersonal links strengthen the enjoyment perception and social interactions of virtual reality service consumers (Lee et al., 2019). Interaction among customers of entertainment services, such as virtual games, can potentially increase enjoyment. Conversely, poor behavior and participation in the activity contribute to worry, a decline in positive values, and diminished confidence and enjoyment (Chen et al., 2006).

Based on the existing study literature (Ede et al., 2012) and previous discussion points, the following hypotheses were proposed:

H3a: Positive C2C interaction has a positive effect on perceived hedonic values.

H3b: Negative C2C interaction has a negative effect on perceived hedonic values.

4.4. Service quality perception

Satisfaction is a measure of a person's overall reaction to a service evaluation or product (Oliver, 1980). Previous research has indicated that customer perceptions of functional value increase system satisfaction (Marinao-Artigas et al., 2020). When users' perception of functional values decreases, their satisfaction also decreases, leading to an increase in negative perceived service quality (Akram et al., 2019).

Recent studies have shown that one of the elements of interaction benefit, perceived social value, is a significant aspect of service quality perception (Bilgili et al., 2014). Consequently, perceived social value boosts user pleasure (Zhou et al., 2014). Nonetheless, discontentment may arise if individuals' sense of social value weakens. A decline in happiness is associated with an increase in negative emotions and a decline in perceived value (Kim et al., 2016).

According to the literature on self-service systems, users perceived hedonic value is a critical mechanism for boosting perceived service quality. In addition, research revealed a relationship among functional value, customer satisfaction, and hedonic value, and perceived service quality (Chitturi et al., 2008). As a result, positive perceptions of social, hedonic, and functional values can result in positive service quality perceptions among online community members.

Therefore, the following three hypotheses were proposed:

H4a: perceived functional value has a positive effect on service quality perception.

H4b: perceived social value has a positive effect on quality perception.

H4c: perceived hedonic value has a significant effect on quality perception.

5. Research methodology

This study analyzed the collected data using two distinct methodological approaches: SEM with IBM SPSS AMOS 28 software and fuzzy-set qualitative comparative analysis with fsQCA 4.0 software. Recently, several researchers have combined SEM and fsQCA (Yueh et al., 2016). Three items for measuring PC2C interaction and three for measuring NC2C interaction were derived from Huang & Hsu (2010) and Reynolds and Harris (2009) respectively. Then, perceived functional (three items) and social (three items) values were measured using three-item scales adapted from Lin (2007) and for measuring perceived hedonic values three items were used adopting from

Wang and Fesenmaier (2004). Lastly, the three items used to measure perceived service quality were derived from Bansal et al. (2005)[1].

5.1. Fuzzy set qualitative comparative analysis

This section describes the study's methodology, followed by a description of its findings. Ragin (1987) introduced fsQCA, and since its inception, it has been progressively utilized by researchers in a variety of fields, most recently in information systems and business studies. This methodology is applicable to both variable-oriented (quantitative) and case-oriented (qualitative) approaches (Ragin, 1989; Yueh et al., 2016). fsQCA offers a method to overcome a number of the limitations of traditional statistical methods, such as regression-based analysis; for example, it allows one to contribute to the complicated interdependencies, conditional paths, and causal relationships among variables, thereby providing a more accurate picture of the factors affecting the outcome variable/s.

5.2. Data collection

We employed a survey to investigate the hypothesized effects in this study. Using a questionnaire as the data collection instrument was deemed appropriate for this study because it is the most affordable way to gather quantitative, scalable, practical data and to get results quicker, compared to approaches using for example case studies or interviews. We collected data using a nonprobability sampling strategy. We recruited the ŌURA Ring study participants from five Facebook groups in which various ŌURA Ring-related topics are discussed (according to our understanding, ŌURA Ring company monitors the Facebook groups). The Ōura Ring is a wearable health device designed to monitor various physiological parameters, such as sleep patterns, heart rate, and activity levels. This device has gained popularity among individuals interested in optimizing their health. The Ōura Ring online community consists of users, enthusiasts, and experts who engage in discussions, share experiences related to using the Ōura Ring and its associated features. The community provides a platform for users to connect, learn, and collaborate based on their shared interest in health tracking and self-improvement.

We invited several ŌURA Ring users and admins of the ŌURA Ring Facebook group to review the questionnaire items for clarity. Every item was measured using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree), and there were no missing

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[1] See survey questions online

values because all questions were required to be answered (The survey has 21 concise questions taking almost 10 minutes to complete, with a neutral option on the Likert scale and a trial test before the real test assure clarity and participant concerns). After the questionnaires were distributed (June 1, 2022), multiple reminders were sent to encourage responses. Over nearly three months, 205 questionnaires were submitted. To test nonresponse bias, we followed an approach suggested by Armstrong and Overton (1977), we compared the first 25% of the respondents with the final 25% of the respondents on all variables using a chi-squared test. The test results showed that the two groups did not significantly differ; thereby, nonresponse bias was not an issue in this study.

5.3. Results and data analysis

The demographic information of the sample is: Of the 205 respondents, 92 (44.8%) were male, and 113 (55.2%) were female. All the respondents were aged 18 years or older, and 5 (2.4%) were aged 18–29 years, 27 (13.2%) were aged 30–39 years, 56 (27.3%) were aged 40–49 years, 59 (28.8%) were aged 50–59 years, and 58 (28.3%) were aged 60 years or older.

Regarding the question about how long the respondents had been members of the Ōura Ring online community, 38 (18.5%) had been members for less than six months, 74 (36.1%) for 6–12 months, 83 (40.5%) for 1–3 years, and 10 (4.9%) for 4–6 years. In turn, regarding the average time that the respondents spent in the online community per week, 175 (85.4%) spent less than five h/week, 25 (12.2%) spent 5–9 h/week, 3 (1.5%) spent 10–19 h/week, and 2 (1.0%) spent 20 h/week or more. Most respondents (97.6%) indicated they had joined the online community because they were Ōura Ring users. However, 1.0% and 1.5% of the respondents had joined it to buy the Ōura Ring or for other purposes, respectively.

5.4. Measurement model

We used the IBM AMOS 28 and SPSS 28 software to assess the reliability and validity of the measurement model. Gefen and Straub (2000) suggested analyzing the path relationships in the research model by first analyzing the measurement model and then the structural model. We evaluated the reliability and validity of the constructs by examining their composite reliability (CR) and average variance extracted (AVE) (Hair et al., 2013). All CR values were above the recommended value of 0.70 (Hair et al., 2011). The AVE values of the constructs were then used to evaluate their convergent validity. All values exceeded the recommended threshold of 0.50 (Bagozzi & Yi, 1988).

Regarding the discriminant validity of the constructs, it has been suggested that their square root of the AVE should be greater than their correlation with the model's other constructs (Fornell et al., 1981). The square root of the AVE of all constructs exceeded their correlation with the other constructs. Consequently, neither the reliability nor the validity of the constructs was compromised. The construct-level statistics regarding the CR, AVE, and square root of AVE values and the construct-level correlations are presented in Table 1.

	CR	AVE	PC2C	NC2C	PFV	PSV	PHV	PSQ
PC2C	0.836	0.631	**0.794**					
NC2C	0.748	0.501	−0.130	**0.707**				
PFV	0.757	0.512	0.603	−0.175	**0.715**			
PSV	0.763	0.518	0.580	−0.169	0.573	**0.719**		
PHV	0.773	0.536	0.500	−0.013	0.421	0.520	**0.732**	
PSQ	0.761	0.517	0.290	−0.132	0.367	0.037	0.120	**0.719**

Table 1. Construct-level statistics.

5.5. Structural model

We employed SEM conducted using IBM AMOS 28 software to assess the research model. The goodness-of-fit of the model was assessed using seven different fit statistics: $\chi2/df$=1.70, GFI=0.92, AGFI=0.89, NFI=0.89, CFI=0.95, TLI=0.91, RMSEA=0.05. The values of all these fit statistics indicate a good fit with the data.

Model fit indices	GFI	AGFI	NFI	CFI	TLI	RMSEA	CMIN/DF
Recommended value	>0.90	>0.80	>0.80	0.90	>0.90	<0.080	<3
Obtained value	0.92	0.89	0.89	0.95	0.93	0.058	1.70

Table 2. Model fit.

Figure 2 illustrates the results regarding the standardized effect sizes, their statistical significance, and the proportions of explained variance. The bold lines indicate statistically significant effects at p < 0.05, whereas the dotted lines indicate statistically insignificant ones. In total, the model was able to explain 57% of the variance in perceived functional value, 77% of the variance in perceived social value, 25% of the variance in perceived hedonic value, and 20% of the variance in perceived service quality. As we hypothesized, PC2C interaction (the co-creation of value by other users) in an online community significantly affected perceived functional, social, and hedonic values. Thus, H1a, H2a, and H3a were supported. There was a significant and strong positive effect of PC2C interaction on perceived functional value (β = .692, p < .001), thus supporting H1a. The results also showed that PC2C interaction also has a positive and strong effect on perceived social value (β = .721, p < .001) and perceived hedonic value (β = .258, p < .001), thus supporting H2a and H3a.

Consistent with our hypotheses suggesting that NC2C interaction has a significant effect on value outcomes, the results indicated that NC2C interaction has a negative impact on both perceived functional (β = –.183, *p* <.05) and perceived social values (β = –.201, *p* <.05). Therefore, H1b and H2b were supported. The current study demonstrated that value could also be co-destroyed by the negative behaviors of other users,

However, interestingly, we did not find any significant effect between NC2C interaction and perceived hedonic value. Therefore, H3b was not supported.

As suggested by H4a, perceived functional value was found to have a significant and positive effect on perceived service quality (β = .274, *p* < .05). However, we did not find any significant effect between perceived social value and perceived service quality or between perceived hedonic value and service quality perception. Therefore, H4b and H4c were not supported. This result implies that when Ōura Ring users interact in the Facebook group and co-create and co-destroy the perceived social value of other users, this does not guarantee the user's perception of Ōura Ring's service quality.

This study did not find a statistically significant difference between perceived hedonic value and service quality perception.

Taking the results of the SEM analysis and the coefficients of the determinants of perceived service quality, PC2C emerges as the most powerful predictor relative to other constructs in the model. In addition, the perceived functional value appears to have the largest effect on perceived service quality (see Figure 2).
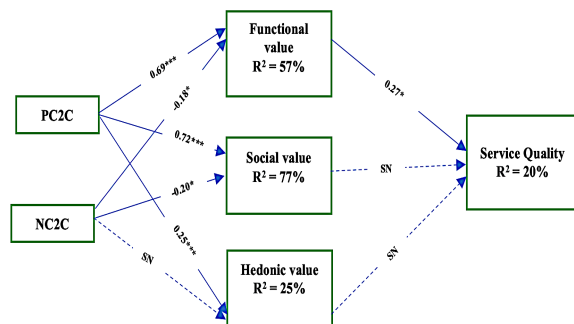

Figure 2. Analysis results.

5.6. fsQCA methodology

Calibration is the initial stage of fsQCA. In this study, calibration rescaled the original values of the dependent variable and the independent variables measured on a 7-point Likert scale into continuous fuzzy values that fell within the interval [0, 1]. On a 7-point Likert scale, for instance, a value of 1 corresponded to a fuzzy value of 0, while values of 4 and 7 corresponded to fuzzy values of 0.5 and 1, respectively (Olya & Alipour, 2015).

A 0 indicated "fully out," or no set membership, while 1 signified "fully in," or full set membership (Ragin, 2009). When calibrating the values, we employed three anchors to represent the degree of membership for each condition (Woodside, 2013): (a) fuzzy score = 0.95 for full membership, (b) fuzzy score = 0.05 for full non-membership, and (c) fuzzy score = 0.50 for a cross-over point. Next, we conducted the necessity analysis. A necessity analysis determines whether there are any variables (conditions, according to the fsQCA) that could be deemed essential for the outcome of interest to happen (Ragin, 2006). Consistency values can be used to determine the significance and relevance of necessary relationships, with values above 0.90 indicating significant relationships.

The results of the necessity analysis revealed no conditions with values exceeding 0.90. Thus, we concluded that none of the data conditions can be deemed indispensable for the outcomes of interest (perceived service quality). The next step was to construct the truth table. After calibrating all values into fuzzy sets, a 2k row truth table was constructed, where k is the number of predictor variables (conditions), and each row represents a feasible combination (Mikalef & Pateli, 2017). Ragin (2009) recommended setting consistency levels to greater than 0.75. Consequently, configurations that did not meet the threshold were excluded from the analysis in this study. Similar to the explained variance, the solution coverage evaluates the empirical relevance of a consistent subcategory (Mendel & Korjani, 2012). The fsQCA creates three groups of solutions: (a) simple, (b) intermediate, and (c) complex. Ragin (2009) suggested using intermediate solutions to describe the findings, emphasizing that the knowledge domain of the researchers plays a crucial role in describing the findings. The following notations will be used to present the results in the tables. Black circles (●) represent the presence of a condition, whereas empty circles (○) represent its absence. The lack of punctuation indicates that the causal condition may be absent or present (Ragin & Fiss, 2008).

5.7. fsQCA results

In all configurations, the presence of perceived functional value was found. In addition, PC2C (present), perceived social and hedonic values (both present), and N2C (present or absent) were observed in two of the three solutions. However, the findings of the fsQCA, while reinforcing the structural model findings, **highlight the critical role of PFV**, which appears in all solutions 1 to 3. Therefore, it is necessary to having a perceived service quality experience. Nevertheless, it is

essential to mention that perceived functional value alone is insufficient, and the presence of PC2C, perceived social value, perceived hedonic value, and the absence of NC2C should not be underestimated. For instance, Solution 1 indicates that the presence of the perceived functional value, PC2C interaction, and perceived social value leads to the outcome of interest. Solution 2 shows that the absence of negative C2C interaction and the presence of perceived functional value, perceived social value, and perceived hedonic value result in the outcome of interest. Therefore, **the absence of negative interaction (VCD) is required to form all perceived values.** Another notable result is that **when VCC and VCD coincide, to have the perceived service quality experience, the presence of perceived functional value and perceived hedonic value is necessary.** It is hard to exclude negative interaction from C2C communication. So, Solution 3 is a highly intriguing conclusion and of considerable assistance to self-tracker providers and designers in addressing the issue in virtual communities. The fsQCA findings revealed an overall solution consistency of 0.812 and a perceived service quality coverage value of 0.711, suggesting that the solutions cover more than 81% of the cases.

Solution	PC2C	NC2C	PFV	PSV	PHV	Raw coverage	Unique coverage	Consistency	Solution coverage	Solution consistency
1	●		●	●		0.670341	0.0952196	0.825222	0.711869	0.812473
2		◐	●	●	●	0.523615	0.0216669	0.88443		
3	●	●	●		●	0.499573	0.0198612	0.89147		

Table 3. fsQCA results.

6. Discussion

This study develops a conceptual model to investigate how users in social media co-create and co-destroy value through positive and negative interactions and how this process leads to the users' service quality perception. we found that **perceived functional value in an online community is necessary to have a perceived service quality experience.** In this regard, resources should be easily accessible. For example, the absence of needed information on products or services given or processed by other users would reduce the perceived functional value (Smith, 2013). This result may occur if others hesitate to contribute reciprocal resources or resource integrators lack the necessary knowledge and skills (Farquhar & Robson, 2017). In PC2C contact, resource matching is effective, and users comprehend and assess a value proposition because an actor (user) communicates clearly (Wang et al., 2019) or delivers accurate information (Järvi et al., 2018), resulting in successful resource matching and positive PSQ. In negative interactions, users may misuse or be unable to use resources due to resource insufficiency (Farquhar & Robson, 2017).

We also found **the absence of a negative interaction (VCD) is required to form all perceived values.** When users can connect effectively with other users, they may get the social benefits of making new friends. Moreover, the sense of involvement or group membership (favorable resource integration) generated by communication increases the perceived social value of the users (Luo et al., 2017). Users' social networks develop social interactions, and social value is derived from establishing or maintaining these relationships (Zhang et al., 2017).

If the active user's preferences do not align with their efforts, the users will see their attempts to talk and share experiences adversely (unfavorable resource integration; Franke et al., 2010). Due to the negative emotional response, perceived hedonic value and service quality perceptions decline (Benlian, 2015).

When there is a pleasant relationship, users communicate accurate and timely information and encourage community collaboration (Vafeas et al., 2016). In contrast, the dissemination of untimely and inaccurate information about the product (complaining), which is a form of harmful complaining (Järvi et al., 2018), poorly timed feedback may result in diminished value perception (Vafeas et al., 2016) and negative perceived service quality. Another interesting finding is **when VCC and VCD coincide in social media, perceived functional and perceived hedonic values are crucial for a pleasant perceive service quality experience.**

Users experience enjoyment and excitement by being in a place where their object of interest (ŌURA Ring) is the main focus. For instance, a user highly interested in self-tracker devices and uses a specific brand (ŌURA Ring) might derive a hedonic experience when they visit an online community where users discuss and share their experiences with that product. These conversations might be interesting and enjoyable, leading to pleasurable hedonistic experiences (Nambisan & Watt, 2008). Therefore, if C2C processes are consistent, customer interactions will increase perceived value.

In positive interactions, users can access sufficient resources, such as necessary information, skills, or time to operate the resources (Farquhar & Robson, 2017). In addition, accurate information may affect the perceived functional value, as users may spend less time (users' resources) acquiring transparent information or matching resources with correct information in predictable ways (Bruce et al., 2019). As customers spend less time and effort, fulfilled expectations may lead to pleasure, resulting in favorable perceived value and further positive perceived service quality.

7. Theoretical and practical implications

This research adds to the literature by shedding new light on the co-creation and co-destruction of value through C2C interactions. Our study expands the present knowledge of VCC beyond the service provider–customer dyads to C2C interactions. In addition, our study is among the first to examine C2C value co-creation and co-destruction in virtual communities in the information technology literature and also provide the solution for self-tracking providers in general and ŌURA Ring provider in particular on how to address the issue when both VCC and VCD occur in online communities to improve users' service quality perception. This research is also consistent with the expanding scholarly interest in the impact of VCC on services (e.g., Li & Tuunanen, 2022). It addresses customer dominant logic's (Heinonen et al., 2010) need for further empirical evidence in diverse service contexts. In addition, we have expanded Plé and Cáceres' (2010) conceptual definition of co-destruction by considering it as an interactional process whereby service experiences are negatively influenced by the misbehaviors of other users, resulting in a loss of value.

Self-tracker technology providers who operate and/or monitor online communities on social media, like Facebook, can use the framework to continuously study how users (or community members) co-create and co-destroy value through their interactions. These results will help the providers mitigate the co-destruction of value and enhance value co-creation, thereby improving perceived service quality.

Contrary to prior assumptions, our study shows that positive interactions don't guarantee a positive perception of service quality. This insight is crucial for practitioners, as it suggests that even when users are actively engaged and contributing positively to the community, service quality perception might not necessarily improve. This finding underscores the need to address multiple aspects beyond user interactions when striving to enhance service quality.

The findings indicated the necessity of adding design aspects to online communities to boost consumer information searches' efficacy, which may entail making interaction archives and other data sources more accessible. In addition, self-tracker providers should offer fast responses to product-related concerns raised by customers in online forums.

Practitioners can provide necessary training to enhance service personnel's abilities to swiftly analyze social settings and the communication skills of frontline employees.

Our study model implies that companies must holistically deploy both their online and offline customer interactions and support strategies. Customers' offline experiences will complement their online community interactions.

In terms of generalizability, while we recognize that the specific dynamics of each online community and product ecosystem can vary, we believe that the conceptual framework we have developed can offer valuable insights into other self-tracker technologies and their respective online communities. Our findings could be extended to other products and communities, while also acknowledging the need for further research to validate and refine our framework in different contexts.

8. Limitations and future directions

We planned to provide initial evidence about C2C value co-creation and co-destruction in the context of information systems. Future studies may expand on the current findings by uncovering other elements that might support or impede the co-creation and co-destruction of C2C values. For example, cultural differences may impact consumers' impressions of others' behaviors. The behavior of others may less impact the individuals in an individualistic culture, as they behave in accordance with their principles, as opposed to social norm.

Despite several efforts to create a measurement for VCC between customers and service providers (Yi & Gong, 2013), as far as we know, there are no scales for C2C VCC and C2C VCD. A lack of measurement has been a critical topic in the service literature, addressing how to implement ideas and design instruments.

This study concludes by proposing and experimentally validating a novel theoretical construct to enhance our knowledge of how interactions in an online community affect consumers' attitudes and perceptions of service quality. Companies should adopt a holistic perspective to manage customers' overall product-related experiences of interactions in such online communities. This study should be seen as the initial step in digital customer services.

8. References

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