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ENHANCING ECOSYSTEM VALUE IN ONLINE FOOD DELIVERY PLATFORMS – THE ROLE OF SERVICE QUALITY AND PROSUMER ENGAGEMENT

Abstract: *In the digital platform setup, multi-actor interactions build up holistic ecosystems that generate and distribute value across actors. To increase the overall value of the platform service ecosystem three ingredients are key: service quality, prosumer engagement and prosumer citizenship behavior. These ingredients are interrelated in several theories, and we develop 5 theoretically conceivable configurations which are disentangled through the lens of configurational theory using Qualitative Comparative Analysis (QCA) on the sample of 529 users of Online Food Delivery Platforms (OFDP). Findings show that service quality creates engagement of prosumers – of individuals who go much beyond the transaction and create value in the platform service ecosystem of decentralized actors. The article provides strategies to increase the overall value of the ecosystem. OFDPs should focus not only on providing good experience at touchpoints, but also use these interactions to engage their users into actions that go beyond the necessary ones.*

Keywords: *service quality, digital service quality, online food delivery platforms, customer engagement, prosumer engagement, multi-actor interaction, platform ecosystem*

1. Introduction

Digital technologies make possible the creation of digital platforms – a business model that facilitate multisided markets by connecting customers (peers), resource owners and complementors (Kapoor et al., 2021; Rangaswamy et al., 2020). The term ecosystem is central for digital platform business (Cobben et al., 2022). The ecosystem is essentially a system of decentralized actors – peers, partners and complementors that can easily move from one side of the market to another (Hein et al., 2020; Teece, 2018) and are outside the

boundaries of the firm (Zeng et al., 2021). While academic literature often suggest that the firm should orchestrate its ecosystem to create value, innovate (Cobben et al., 2022) and grow, it is also possible that actors' goals in the ecosystem might be potentially diverging. At least, different actors may extract differing levels of value from interactions (Hollebeek et al., 2020). Thus, there might be potential trade-offs when platforms try to strike a balance between achieving customer loyalty and ecosystem functionality within the digital platform context. Thus, platforms need to nurture customer loyalty while ensuring the functionality of the broader ecosystem.

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Service quality is the key element of the value proposition of the platform (Akhmedova et al., 2020a). It has been demonstrated by numerous studies that service quality is key to customer satisfaction and loyalty (Ju et al., 2019; Homyamien et al., 2025). Prosumers interact with the platform at three points. First, at website/app peers' access to search and compare different offers, discover food opportunities, and order. Second, prosumer customers interact with riders through online channel (if they need to add delivery specifications) and offline (when the package is delivered). Finally, in case of service failure, prosumers would interact with customer support. Platforms use different mechanisms, such as reputation systems to actively perform a 'regulatory'/control role over decentralized service providers. Part of the service is controlled by the platform itself. Continuous improvement of the web/app and functioning of the customer service in case of service failure are important ingredients of service quality on digital platforms.

While service quality remains a critical factor for any platform's success, prosumer engagement adds a new dimension to loyalty. Traditional customer loyalty, driven by service quality, is often transactional; consumers return because the platform consistently meets their functional needs (e.g., timely deliveries, reliable service, and ease of use). However, prosumer loyalty is built on a foundation of deeper emotional and cognitive ties with the platform. The concept of engagement emerged in a conceptual shift in management from a transactional approach to a relationship approach (Islam et al., 2019). Companies realized the importance of looking beyond the purchase as the ultimate outcome to consider long-term value-laden interactions between the firm and the customer as a source of firm profitability. Loyalty built on engagement is driven by meaningful cognitive and emotional (Brodie et al., 2011) participation in the ecosystem, co-creation with other users, and spreading positive word of mouth, making prosumers essential to the platform's overall success.

Citizenship behaviours are essential because they encourage prosumers to invest time and energy into activities that benefit the platform's ecosystem, thereby increasing its overall value. However, service quality alone might not be sufficient to foster these behaviours. While high service quality can create satisfaction, it may or may not trigger the deeper emotional and cognitive engagement required for prosumers to engage in citizenship behaviours. Similarly, engagement alone may or may not lead to consistent citizenship actions without a strong relational foundation. According to Hollebeek and Macky (2019), cognitive and emotional engagement generated through multiple interactions contributes to creation of behavioural engagement, which, in turn, may (or may not) foster citizenship behaviours (e.g. positive WOM, helping other customers, blogging or writing a review).

In the digital age, consumers' ability to take on roles beyond traditional consumption and become prosumers has emerged as a key feature (Ritzer et al., 2012). While most research has focused on consumers, two-sided platforms benefit from expanding their base of active and loyal users (loyal prosumers). For digital platforms, understanding how to encourage this transition is essential for growing their user base. The goal is to shift one-sided users—those who are solely consumers—into prosumers, thereby enhancing platform value and ecosystem engagement.

Based on the considerations above we propose the following research questions:

In the context of digital platforms, how the value of the service ecosystem could be increased?

The present study offers important insights into the role of service quality, prosumer engagement, and citizenship behaviour in fostering customer loyalty within digital platform ecosystems, specifically in the context of OFDP. The results show that there are two types of loyal users on OFDP: loyal prosumers and loyal consumers. Service

quality emerges as the single indispensable antecedent of loyalty for both types. Loyal prosumers are consumers who are driven not only by personal, but also by social needs. Their relationship with the platform is not limited to repeated purchases, but rather decentralized and multifocal. The key differentiator between the two types is the presence of emotional and cognitive engagement in case of loyal prosumers and its absence in case of loyal customers. Accordingly, platforms should provide good level of service quality at different touchpoints to achieve loyalty, while simultaneously try to engage users cognitively and emotionally in order to increase the overall value of the ecosystem by having each user contributing beyond the purchase. All in all, results are in line with previous research highlighting the importance of service quality in digital platforms, but our study extends this understanding by demonstrating that while service quality is necessary, it is not sufficient for prosumer loyalty.

2. Theoretical background

2.1. Value creation in the ecosystem

The service ecosystem literature assumes that actors are willing to contribute their resources and behave in the best interest of the ecosystem. According to the platform governance literature, platforms use a set of rules, awards, and control mechanisms to address market frictions in coordinating and deploying co-specialized capabilities (Chen et al., 2022; Zhang et al., 2020). Although, there is quite extensive research available on governance mechanisms (Chen et al., 2022), not much is known about the outcomes of governance and essential elements of the ecosystem functioning. There are at least two interrelated research paradigms that can explain why and how the ecosystem functions.

First, the paradigm of S-D logic suggests the importance of looking beyond the purchase as

the ultimate outcome and considering long-term value-laden interactions between the firm and the customer as a source of firm profitability (Islam et al., 2019). S-D logic asserts that services and not goods are the units of exchange and that the mutual actions of consumers and service providers result in value co-creation. Under this paradigm, many studies regard customer engagement (CE) as foundation of value co-creation. The concept of CE refers to a net sum of cognitive, emotional, and behavioural investments into relationship with the firm (Brodie et al., 2011), extended community or the ecosystem. Some authors suggest that CE (i.e., cognitive and emotional state) trigger citizenship behaviour associated with the foci of engagement. On the contrary, other authors suggest that customer engagement conceived as an individual cognitive-emotional characteristic of the customer is not always revealed by a corresponding engagement behaviour; instead, loyalty can be the response of the customer engagement (de Oliveira Santini et al., 2020).

Second, the expectancy-disconfirmation theory (EDT) (Oliver, 1977), social exchange theory (SET) (Blau, 1964) and attribute-based techniques (Parasuraman et al., 1985) complement the previous scenario explaining the origin of the CE. According to social exchange theory (SET) the interaction among agents of an ecosystem is not linear, but progressive and includes learning and adaptation of one's actions as a result of previous interactions (Cropanzano and Mitchell, 2005, p. 890). Accordingly, trust theory and perceived justice theory explain the willingness to be dependent as the base of relationships. The relationship quality perspective allows to look at service quality and satisfaction from the perspective of ongoing long-term orientation, as opposed to that of episode perspective emphasized in transactional marketing. Relationship benefits (Hennig-Thurau et al., 2002) may come in the economic and non-economic form and would lead to relationship quality: commitment, satisfaction, trust (Agag, 2019;

Verma et al., 2016; Zhang et al., 2016) and engagement (Luo, Wang, et al., 2019).

Socio-technical (S-T) perspective is an important complement to the SET, enables modelling relations not only between human actors, but also, for example, human-robot interactions (Morgan-Thomas et al., 2020). Digital technologies, fostering interaction, bring new perspectives in the customer engagement research (Morgan-Thomas et al., 2020). Service encounters at digital platforms are significantly different from that in the traditional business setup, leading to the new paradigm of service encounters based on multi-actor interactions (Alexander et al., 2018). The role of customer in this new paradigm can be more active and multi-focal (peer, friends, partner restaurant, rider, chatbot, algorithm (Barari et al., 2021). Social network theory and service ecosystem view ground the idea that value is maximized across the ecosystem, with different actors being able to extract differing levels of value from interactions (Hollebeek et al., 2020).

The two paradigms are related, but there is not much research that relates both in one study (Islam et al., 2019). Furthermore, based on examination of these two paradigms we can outline 3 key elements of the functioning of the platform service ecosystem:

- **Service quality perceived** by prosumer at different touchpoints - High service quality continuously perceived by prosumer at different touchpoints can be the basis of the prosumer engagement under the first paradigm (de Oliveira Santini et al., 2020). It is also the basis of trust and the consumer willingness to be dependent on the relationship under the second paradigm. Service quality continuously perceived by prosumer at different touchpoints might lead to the development of citizenship behaviour through learning and adaptation of the behaviour.
- **Prosumer engagement** - Engaged prosumers invest cognitively and emotionally in the platform, playing an active role in value co-creation within the digital ecosystem.

Their engagement strengthens the platform's communal value by fostering meaningful interactions with other users and service providers.

- **Prosumer citizenship behaviour** - Citizenship behaviour, like helping other users or providing feedback, enhances the quality of interactions with human and non-human actors (e.g., riders, chatbots). These behaviours create a feedback loop where service providers, such as delivery personnel, can adapt to customer preferences based on positive interactions, further boosting service quality. Prosumers who display citizenship behaviour contribute directly to the ecosystem's growth by generating additional value through positive engagement and collaborative efforts.

In summary, the three elements are key factors in the ecosystem that exert its influence in a non-linear, but rather cyclical relationship. Positive experiences and engagement can reinforce each other and encourage prosumers to become active contributors of value in the ecosystem. The increased value of the ecosystem will affect the perception of quality and most likely will increase engagement of different actors. This calls for application of the configurational theory and corresponding methods of research.

2.2. Service quality, prosumer engagement, citizenship behaviour and loyalty– a configurational approach

Prosumers are “individuals who consume and produce value, either for self-consumption or for consumption by others” (Lang et al., 2021, p. 178). Prosumers on digital platforms contribute by constructing on-demand resource adaptation, building big-data-driven network effects, or enabling ecosystem resource coordination (Zeng et al., 2021). Not any consumer at a digital platform can be qualified as prosumer. Prosumers are different from “consumers who co-create” value mainly to better satisfy their

consumption needs (Małecka et al., 2022), as they motivated not only by individual, but also by social factors (Chandler and Chen, 2015, p. 234). But not all peer consumers even if they buy repeatedly on the platform are active contributors to the ecosystem, nor all are motivated by social factors. In this sense, digital platforms have two primary objectives: first, to have a sufficient number of loyal consumers (Akhmedova et al., 2020a); and second, to increase a share of prosumers among the loyal consumers (Linet al., 2019).

There might be several reasons why consumers and prosumers are loyal to the platform. Ecosystem thinking helps us understand how additional value is created by the platform, but the elements of the ecosystem functioning might or might not all be necessary for loyalty creation. According to the configurational theory, while the outcome in social science rarely occurs because of an isolated factor, the same outcome can be achieved by arranging causal conditions (a mix of antecedent factors) in one way or another (Fiss, 2007). According to this view there might be only a finite number of scenarios – psychological pathways that lead to a particular outcome in (consumer) behaviour. The relationship between service quality, engagement, citizenship behaviour and loyalty is a relatively unexplored terrain (Islam et al., 2019). The analysis of the literature revealed that there are potentially at least four main configurations that link the elements of the ecosystem functioning on the one hand, with loyalty, on the other hand (Figure 1 and Table 1).

Possible path #A. Different theories might be called to explain how perceived service quality leads to prosumer loyalty (see Table 1). By consistently meeting or exceeding customer expectations, providing a positive customer experience, offering a favourable cost-benefit ratio, and building a strong customer-provider relationship, OFDP can create a loyal customer base that continues to use its services for their food delivery needs.

Under this configuration, consumer is the final receptor of value created by the ecosystem, strictly should not be qualified as prosumer, as she does not create or co-create value in the platform ecosystem.

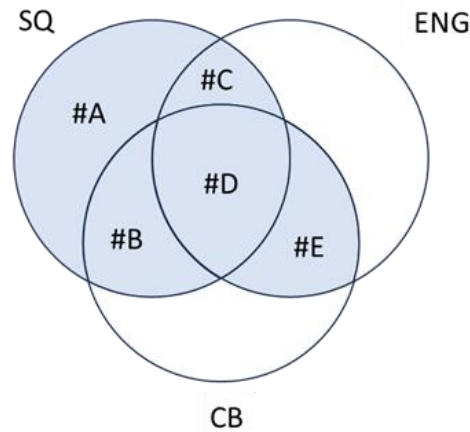


Figure 1. Research model presenting theoretically conceivable combinations of key elements of the ecosystem functioning

Note: SQ – service quality; ENG – prosumer engagement; CB – citizenship behaviour. theoretically conceivable combinations are marked in grey and enumerated in letters

Possible path #B. High service quality serves as the foundation for fostering trust, satisfaction, and perceived fairness, which are crucial for building strong, positive relationships within the platform ecosystem. When consumers consistently experience high service quality, they are more likely to adopt prosocial behaviours—acting in ways that benefit both the ecosystem and the wider community. Over time, this shift encourages greater loyalty as users become more invested in the platform's success. In this scenario, the consumer transitions from being a passive recipient of value to an active prosumer, contributing to the overall health and growth of the ecosystem.

Table 1. Possible configurations of antecedents of loyalty of prosumers

Possible configuration	Theories	Some articles that explore this combination
#A	Expectancy-disconfirmation theory, service quality; servicescape and customer experience; cost-benefit approach; relationship quality.	(Abbes et al., 2020; Agag, 2019; Fam et al., 2021; Gallarza et al., 2022; Marimon, et al., 2021; Rauyruen & Miller, 2007; Styliadis et al., 2022; Verma et al., 2016)
#B	Relationship marketing; service quality; customer reputation; trust theory; cognitive-affective-conative model; perceived justice theory; relationship quality; S-D logic, Experience service quality; S-T theory, relationship quality literature.	(Hajli et al., 2017; Luo, Wong, et al., 2019; Melián-González & Bulchand-Gidumal, 2017; Saleem et al., 2024; Shi et al., 2022; Tajvidi et al., 2020; Wu & Gao, 2019)
#C	Cognitive-affective-conative model; theory of engagement; service experience; emotional intelligence.	(Alonso-Dos-Santos et al., 2018; Chuah et al., 2021; Itani et al., 2019; Ma et al., 2023; Ooi et al., 2022; Prentice & Nguyen, 2020; Wei & Prentice, 2022)
#D	Service experience; service quality; customer engagement; relationship quality.	(Islam et al., 2019; Le et al., 2021; VO et al., 2020)
#E	Customer engagement, personal engagement theory	(Hollebeek et al., 2020, 2023; Liu et al., 2019; Luo, Wang et al., 2019; Zhang et al., 2017)

Note: SQ – Service quality; ENG – prosumer engagement; CB – citizenship behavior

Possible path #C. High service quality across touchpoints lays the foundation for favourable cognitive perceptions and positive emotional responses from users. This consistent quality enhances customer satisfaction, leading to increased engagement with the platform. In this configuration, engaged consumers are more likely to exhibit repeat purchase behaviour, reinforcing their loyalty to the platform. However, despite their loyalty, these consumers remain passive recipients of value rather than active co-creators.

Possible path #D. Engaged prosumers, driven by perceived quality of positive experiences, are more likely to actively contribute to OFDP's community (Hollebeek et al., 2018), this drives positive WOM (Mainolfi and Vergura, 2022; Wu et al., 2018). Individuals with high motivation and engagement will express stronger messages to the community and others. This, in turn, enhances customer loyalty as customers continue to use OFDP's service, and repeat purchase.

Possible path #E. In this scenario, service quality is not a necessary antecedent for prosumer loyalty. Engagement alone is sufficient to drive prosocial contributions and value co-creation. Engaged prosumers are more likely to co-create value and make contributions beyond the consumer role (Hollebeek et al., 2023; Zhang et al., 2017). The engagement might be potentially not driven by functional benefits – such as perceived service quality, but by emotional factors (Liu et al., 2019) or the quality of interaction and the citizenship behaviour of community members (Luo, Wang, et al., 2019).

3. Methodology

3.1. Method

Quantitative data was analysed by means of qualitative comparative analysis (QCA) since this is an ideal way to identify which configurations of mission fit help social

achievement. QCA basically enables configurations to be tested empirically within the enterprise setting (Fiss et al., 2013). The logic of analysis in QCA is different from that in structural equation modelling (SEM) or other econometric methods (Fiss et al., 2013). QCA studies causal complexity by assuming that cases represent some mix of causes and conditions (not “independent variables”) that correspond to the outcome (not “dependent variables”). In contrast, most econometric models estimate the impact of individual explanatory variables on a dependent variable, holding everything else constant and implicitly assuming unifinality and symmetric causality. For mission achievement we assumed unifinality, with the three ends of the social mission, the what, the how, and the why, aligned for its achievement. For mission non-achievement, we expected equifinality related to the different types of PEs.

3.2. Measures

Measurement items were adapted from previous studies but were slightly re-worded to adapt to the context (see Appendix A). To measure factors that contribute to relationship formation we draw on the scale of service quality for sharing economy developed by (Marimon et al., 2019). Accordingly, web/app organization we used (Marimon et al., 2019) scale for site organization, essentially capturing web/app ease of use; combining it with perceived usefulness dimension of quality one by (Pavlou, 2003) and another – newly developed. This approximation of web/app platform quality has been established in the recent literature (Akhmedova et al., 2021a), and essentially is routed in TAM (technology acceptance model) framework (Pavlou, 2003). To measure quality of interaction with riders a scale to measure quality of interaction with prosumer (Marimon et al., 2019) was used. One new item was added to adapt to the study setup. Finally, platform responsiveness was measured by a combination of items for

platform responsiveness and platform structural assurance (Marimon et al., 2019).

The original concept referred mainly to firm-initiated, customer-brand relation, where firm or brand was the central foci of customer attention. The Internet brought about new business channels and new forms of communication. The term customer engagement started to transition to actor engagement – reflexing increasing number of roles involved in the interaction, the increasing complexity of interactions happening at different levels and complex engagement foci, beyond dyadic customer-firm (Brodie et al., 2019). Finally, nowadays, with the advent of different forms of digital business platforms and the proliferation of social media platforms and digital business platforms, the umbrella term actor engagement is increasingly reduced to specific terms of engagement, including new labels such as prosumer engagement (Lin et al., 2019), stakeholder engagement (Hollebeek et al., 2020), and social media engagement (Dessart, 2017; de Oliveira Santini et al., 2020).

We define prosumer engagement based on the theorization of (Lin et al., 2019), as a state characterized by high cognitive, emotional, and social involvement that occurs as a result of satisfactory online and offline interactions with actors in the platform service ecosystem and results in a predisposition to co-create and contribute resources to this service ecosystem and to patronize it in the outside world. According to this definition, prosumer engagement is broader than customer engagement (Brodie et al., 2011) as it is taking into account different interactions within the platform ecosystem; and is narrower than actor engagement (Brodie et al., 2019) as it only refers to the platform ecosystem setup. To operationalize customer engagement creation we drawn on two most commonly used scales to measure customer engagement: (Hollebeek et al., 2014; Viveket al., 2014). Notably, we used Vivek et al., (2014) dimension called ‘social connection’ representing ‘the enhancement of the

interaction based on the inclusion of others with the focus of engagement' (Vivek et al., 2014, p. 407). We consider that food is a social experience, that has a variety of social meanings and interaction goals (sharing a meal with friends or families, have a business lunch, dating). To operationalize factors related to CE contribution we used scales by (Eigenraam et al., 2018; Hollebeek et al., 2014; Obilo et al., 2021; Yang et al., 2015). In all cases, statements were slightly reworded to make them appropriate for the research context and the SEP type. A five-point Likert scale was used to assess the questions (ranging from 1 = 'strongly disagree' to 5 = 'strongly agree').

3.3. Data collection, data description and measurement model

A specialized company assisted with the data collection. The data was collected in one wave during the second half of June 2021 (from June 10th of June 17th). The survey introduced the topic of research and briefly explained the main concepts, such as OFD, deliverymen (riders) and so on. Respondents were asked whether they have used any of the four major OFD platforms as clients. Then they were asked to select just one OFD platform (UberEats, JustEat, Deliveroo and Glovo) and to answer further questions on behalf of the selected platform. After the first set of questions related to research objectives, respondents were asked demographic questions. The survey included quality check questions.

4. Results

4.1. Descriptive data analysis

As a result, an international sample of 529 OFD users was obtained (Table 2). The majority of participants responded on behalf of Just Eat (38,4%), one third responded on behalf of UberEats (30,8%), and one quarter selected Glovo (26,5%). The rest responded on behalf of the Deliveroo (4,3%). Gender

distribution was roughly similar (45% male and 55% female). Age categories were quite proportional, covering 4 major customer segments.

Table 2. Descriptive statistics of the sample (N=529)

Variable	Values	Frequency (N)	Percentage (%)
OFD	UberEats	163	30.8
	Just Eat	203	38.4
	Glovo	140	26.5
	Deliveroo	23	4.3
Gender	Male	239	45.2
	Female	290	54.8
Age	20 to 29	119	22.5
	30 to 39	146	27.6
	40 to 49	127	24.0
	50 +	137	25.9
Urbanization size (habitat)	<10,000 inhabitants	23	4.3
	10,001 – 20,000 inhabitants	21	4.0
	20,001 – 50,000 inhabitants	49	9.3
	50,001 – 100,000 inhabitants	66	12.5
	100,001 – 500,000 inhabitants	210	39.7
	>500,001 inhabitants	160	30.2

4.2. Measurement model

Exploratory factor analysis (EFA) was conducted to assess the convergent and discriminant validity of the items. Both the Kaiser Meyer Olkin (KMO) index (.950) and Bartlett's test ($\chi^2 = 10,759$, with 435 degrees of freedom at a significance level of .000) indicated that factor analysis was appropriate for these data. We used (Kaiser, 1960) eigenvalue higher than 1 criterion (Zwick and Velicer, 1986). As expected, 7 factors appeared as a result of the analysis. Jointly, the 7 factors explained most variation in the sample (70.612%). Items were accomplishing

the strict criteria: loaded higher than 0.600 (suggesting good convergent validity) and loaded less than 0.350 simultaneously on two or three components (good discriminant

validity). Appendix A shows the seven independent EFA of the dimensions emerged from the first EFA including all items. It is shown for robustness purposes.

Table 3. Results of reliability and discriminant validity analysis

Construct	Alpha Cronbach	Composite Reliability	Average Variance Extracted	1	2	3	4	5	6	7
1 WAI	0.927	0.945	0.774	0.880						
2 RID	0.874	0.914	0.726	.506**	0.852					
3 RES	0.856	0.904	0.703	.561**	.546**	0.838				
4 PE	0.896	0.965	0.632	.510**	.399**	.516**	0.795			
5 COC	0.875	0.909	0.667	.445**	.404**	.396**	.530**	0.817		
6 WOM	0.881	0.909	0.684	.601**	.440**	.551**	.694**	.609**	0.884	
7 LOY	0.865	0.917	0.788	.521**	.374**	.465**	.604**	.436**	.622**	0.887

** Correlation significant at the 0.01 level (bilateral)

Diagonal elements are the square roots of the average variance extracted.

WAI - Web/ app organization, RID - Quality of interaction with riders, RES - Platform responsiveness, PE - Customer engagement, COC - Co-creation with internal stakeholders, WOM - Word-of-mouth, LOY - Loyalty

The reliability of the seven constructs was assessed using Cronbach's alpha coefficients (α) and composite reliabilities (CR). Table 5 shows both α and CR values for each construct. All these statistics far exceed the 0.700 recommended thresholds (Hair, Black, Babin, & Anderson, 2010). To ensure convergent validity, average variance extracted was calculated and, as can be seen from Table 3, it exceeded the recommended 0.500 threshold (Fornell and Larcker, 1981). To assess discriminant validity, we compared the square root of average variance extracted for each construct with its correlation to other constructs (Fornell and Larcker, 1981).

Common method bias

Given that measurement model is self-reported, the common method bias (CMB) is potentially a threat. To address this possibility, we performed Hartman's single factor test – a common data treatment in this situation (Podsakoff et al., 2011). The test was performed by extracting only one factor from the totality of items in a unrotated principal components analysis (EFA). The results revealed that the factor explained 41% of variation, which is less than 50%, below the recommended (Podsakoff et al., 2011). Additionally, CMB is improbable when

correlations between constructs are not high (below 0.90 see Table 5) (Pavlou et al., 2007).

4.3. QCA

Once the robustness of the measurement model was established, the explanatory conditions and the outcome were transformed (calibrated) into fuzzy sets. Fuzzy sets are used to adapt variables for QCA. We normalized each variable in SPSS and then used the direct calibration available in fsQCA software version 3.0 for Mac to convert each variable into fuzzy sets. We used the 10th percentile as a threshold for the full non-membership point (0.05), the 50th percentile as a threshold for the cross-over point (0.5), and the 90th percentile as a threshold for full membership (0.95) (see Table 4 for a summary).

Before proceeding with the analysis, we ensured that none of the antecedent conditions in the necessity analysis showed a consistency score exceeding the threshold value of 0.9 (Schneider and Wagemann, 2010). In the final step, the model was tested running the Quine–McCluskey algorithm and creating a truth table.

Table 4. Calibration of constructs

First-order construct	Second-order construct	Min-max	Full membership	Cross-over point	Full non-membership
Fuzzy scores assigned	sets		0.95	0.5	0.05
Service quality	1 WAI	-3.995; 2.151	1.174	0.066	-1.352
	2 RID	-3.477; 2.542	1.137	0.030	-1.182
	3 RES	-3.712; 2.435	1.204	0.048	-1.320
Engagement	4 ENG	-3.236; 2.183	1.206	0.066	-1.378
Citizenship behavior	5 COC	-3.607; 3.166	1.188	0.038	-1.243
	6 WOM	-3.600; 2.737	1.270	0.056	-1.375
Loyalty (Outcome)	7 LOY	-3.569; 2.233	1.179	0.103	-1.253

Consistency in QCA indicates the extent to which the combination of conditions shows the same result. Commonly used thresholds of 0.8 for consistency (Ragin, 2006) and 0.65 for the Proportional Reduction in Inconsistency Index (PRI) were used for coding the truth table (Schneider and Wagemann, 2012). Each combination of conditions with threshold consistencies above these was thus coded as 1 and retained, while those whose consistency was below these thresholds became logical reminders.

Following Ragin (2006), we report the intermediate solution in Table 5. The results are presented as suggested by Fiss (2007), where “●” represents the presence of the condition, “X” indicates its absence, and “-” denotes ambiguity of the condition, a condition that can either present or absent. The study distinguishes between core and peripheral causal conditions (Fiss, 2011). A core condition (marked in grey in Table 5) is one that has a strong causal relationship with the outcome (that is, it appears in both parsimonious and intermediate solutions). A causal condition that is peripheral has a weaker causal relationship with the outcome (that is, it only appears in the intermediate solution).

Table 5 shows the values for raw and unique coverage, and the consistency for each configuration, as well as solution coverage and solution consistency, indicating the overall “goodness of fit” of the model. The coverage was 0.555, exceeded the recommended value of 0.450 (Ragin, 2009). Consistency, the indicator that shows whether the outcome can be produced regularly, was 0.862 and exceeded the recommended value of 0.740 (Ragin, 2009).

As a result of the analysis, we obtain 4 viable configurations. Configuration 1 having highest raw and unique coverage is the most common on the OFDP. Configurations 2 to 4 have relatively similar raw and unique coverage suggesting that are equally frequent. Configurations 1 to 3 are clearly different from configuration 4 as the latter is based only on one antecedent – service quality, while the latter is based simultaneously on all antecedents: service quality, engagement and citizenship behaviour. This enables us to suggest that there are two types of users: first type, bolstered by configuration 1 to 3; and, second type, bolstered by configuration 4. We label the first type “loyal prosumers” and the second type “loyal consumers”.

Table 5. Results of the QCA

		Configurations			
Antecedent conditions		Conf. 1	Conf. 2	Conf. 3	Conf. 4
Service quality	1 WAI	●	-	●	●
	2 RID	●	●	-	●
	3 RES	-	●	●	●
Engagement	4 PE	●	●	●	X
Citizenship behavior	5 COC	-	●	●	X
	6 WOM	-	X	X	X
Theoretical configuration confirmed		#C/#D	#D	#D	#A
Raw coverage		0.413	0.205	0.204	0.185
Unique coverage		0.219	0.030	0.029	0.031
Consistency		0.883	0.912	0.912	0.905

Note: “●” represents the presence of the condition, “X” indicates its absence, and “-” denotes ambiguity of the condition. Configurations marked in grey – core (strong relationship between antecedents and the outcome), others – peripheral (weak relationship); “Conf.” – Empirically confirmed enumerated configurations.

Service quality is a key antecedent in all four configurations – it is the only antecedent that is indispensable for each of configurations leading to loyalty. Engagement is indispensable for three configurations: configuration 1 to 3. Citizenship behaviour is partly presented in the form of co-creation with other stakeholders in configurations 2 and 3, still, configuration 1 suggests that both co-creation and positive WOM might or might not be present in loyal users of platform services. In other words, service quality is necessary for both types of loyal users, it is no sufficient for loyal prosumers who also require engagement and possibly show some elements of citizenship behaviour.

Configuration 1 and 4, in addition, are core configurations, suggesting that these configurations have stronger evidence compared to configuration 2 and 3. This suggests that configuration 1 is most strong evidence of “loyal prosumer” type, while configuration 4 is a strong basement of type “loyal consumer”.

Figure 2 is a simplified visual presentation of the proposed research framework. We use a Venn diagram as recommended by Schneider and Grofman (2006). As it can be seen, we confirm three out five theoretically conceivable configurations, namely #A, #C and #D. Theoretical path #D received the most support as it is bolstered by three configurations: 1, 2 and 3. Theoretical path

#C is only potentially supported by configuration 1 as citizenship behaviour might or might not be presented. Given this evidence, theoretical path #D is more probable than theoretical path #C. Finally, clear evidence confirming theoretical path #A was found – supported by configuration 4.

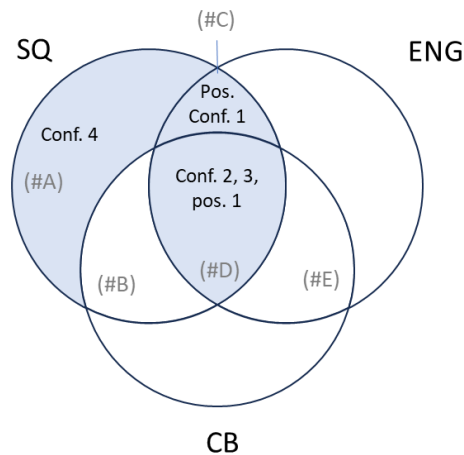


Figure 2. Empirically confirmed combinations of key elements of the ecosystem functioning leading to customer loyalty

Note: SQ – service quality; ENG – prosumer engagement; CB – citizenship behavior. Theoretically conceivable combinations are marked in grey and enumerated in letters; “conf.” – empirically confirmed enumerated configurations; “pos.” – possibly.

5. Discussion

The results of the study show a difference between two types of loyal platform users: loyal consumers and loyal prosumers. To appreciate the implications of this finding we look in detail into the characteristics that differentiate between them. For the value-creation in the ecosystem, it is essential that consumers act as prosumers. As notice (Malecka et al., 2022), co-creation is only a “side effect” of prosumption – as the ultimate prosumer motivation is personal and social - being different; yet, developing social bonds and sense of belonging to the community through conventions, habits, and other regular activities. Consumption is individualistic, while prosumption is social. Accordingly, we define two paradigms that outline 3 key elements of the functioning of the platform service ecosystem. We examine theoretically conceivable combinations, and we find that three out of five theoretically conceivable combinations are supported empirically.

Findings suggest that there are practically two possibilities. First group of configurations englobes three possibilities where engagement and citizenship behaviour are formed. This type of peer is labelled “loyal prosumer”. The second possibility for platforms – achieving loyalty of customers without engagement and citizenship behaviour. This type of peer is labelled “loyal consumer”. The key antecedent of loyalty in both cases is service quality. The key differentiator between the two types is the presence of emotional and cognitive engagement in case of loyal prosumers and its absence in case of loyal customers. This has important practical and theoretical implications. We develop each possibility in detail.

Loyal prosumers are users whose relationship with the platform is multifaceted. They not only consume services but actively participate in co-creating value, whether through collaboration with other users, peer-providers, or other ecosystem actors. This engagement extends beyond simple

purchases, involving actions like generating positive word of mouth (WOM) and collaborating on value creation processes. These behaviours are supported by configurations 1, 2, and 3, all of which emphasize the importance of engagement and citizenship behaviour.

The theoretical explication is the following. The relationship between these active consumers (prosumers) and the platform is formed through a series of interactions with human and non-human actors (Larivière et al., 2017) at digital and offline encounters. That becomes the basis of their engagement. Once engagement starts to develop prosumers might be making boundedly volitional contributions to platform ecosystem: leaving customer feedback, recommending, talking about the brand, learning about the brand, working for the brand, having fun (Eigenraam et al., 2018). All these actions of prosumers are valid and important contributions, that enable platforms to orchestrate value co-creation in the ecosystem of actors (Hein et al., 2020) facilitating value to all actors in the ecosystem, as opposed to creation of value through product features that provide certain benefits only to the customer (Wirtz et al., 2019). Specifically, these contributions can set the basis for creating trust systems (Akhmedova et al., 2021b; Yang et al., 2019), increase perceived authenticity of content (Eigenraam et al., 2021), and can be a source of innovation for the firm (Akhmedova et al., 2020b; van Doorn et al., 2010; Hein et al., 2020), and its profit in the long run (Beckers et al., 2017).

In contrast, loyal consumers are primarily value extractors. Their loyalty is based solely on repeated transactions, and their interactions with the platform lack the additional layer of engagement and prosocial citizenship behaviour found in prosumers. Configuration 4, which is based solely on service quality, represents this type of user. While these consumers are loyal, their relationship with the platform is transactional rather than participatory, and their contribution to the ecosystem is limited to

their own consumption. These consumers require a high quality of service at each touchpoint of the platform. Consumers perceive OFDP as a transactional brand and not as a brand that is different from the ‘other food services’, loved and unique is important. Given the digital food delivery competitive scenario is extremely crowded, with many brands launching specialist, well-positioned services and generic players working cross-industry, this positioning would not protect the brand from multihoming – behaviour is frequent in this setup (Hein et al., 2020).

Service quality emerges as the single indispensable antecedent of loyalty across all configurations. Whether a user is a prosumer or a consumer, consistent high-quality service is a prerequisite for fostering loyalty. This finding aligns with previous research highlighting the importance of service quality in digital platforms, but our study extends this understanding by demonstrating that while service quality is necessary, it is not sufficient for prosumer engagement. For loyal prosumers, service quality acts as the foundation upon which engagement and citizenship behaviour are built. In configurations 1, 2, and 3, service quality interacts with engagement and citizenship behaviours to foster a deeper, more socially-oriented loyalty. For loyal consumers, as represented by configuration 4, service quality alone is sufficient to maintain loyalty, albeit without the additional value generation seen in prosumers.

Findings confirm that engagement differentiate prosumers from consumers. Loyal prosumers not only interact with the platform to meet personal needs but also contribute to the broader ecosystem by co-creating value, either directly through collaboration with other users and stakeholders (configurations 2 and 3) or indirectly through positive WOM (configuration 1). Citizenship behaviour, which manifests as actions that benefit the platform and its community, plays a different

role in the configurations. While it is indispensable in configurations 2 and 3, configuration 1 shows that loyal prosumers may or may not exhibit citizenship behaviour, indicating that prosumer loyalty can still be achieved through engagement and service quality alone.

5.1. Managerial implications

For digital platforms, specifically for OFDP, findings suggest that while providing excellent service quality is critical for fostering any type of loyalty, achieving the full potential of ecosystem value requires strategies aimed at enhancing prosumer engagement. Platforms should not only optimize the user experience at various touchpoints but also actively seek to engage users cognitively and emotionally. This can be done by creating opportunities for users to participate in co-creation activities, collaborate with other stakeholders, or contribute through WOM and other forms of social engagement. Accordingly, platforms can develop features and incentives that encourage prosumer behaviours, such as feedback loops, community-building features, or rewards for co-creating value with other users or businesses. Food is much more than a source of energy, so providing opportunity to self-expression – for example, being a food critic or a “collector” of experiences could reinforce the PE to the platform. Also creating a community to exchange kitchen recipes, develop menus to local restaurants, or appealing ways to present a dish might strengthen co-creation. Platforms could also focus on creating personalized experiences that foster emotional and cognitive engagement, such as tailored recommendations or exclusive content, which may enhance prosumer involvement. Table 6 provide a summary of potential actions that platforms can implement.

Table 6. Managerial propositions that arise from the research

Types of repeated purchase	Goal	Mechanisms	Description	Features
Configuration 4	Assuring service quality at principal touchpoints: web/app, riders, restaurants	1. Quality control and rewards for decentralized actors: riders, restaurants	Giving rewards for providing service quality	Recognition: Award digital badges or recognition to obtain better remuneration Gamification: Introduce gamification elements such as leaderboards where riders/ restaurants can see how they perform against others
		2. Continuous improvement of the app	Consistently monitor, evaluate, and refine app's performance and quality	Collecting user feedback, analyzing data, testing new features, and updating your app regularly
Configurations 2 and 3	All above + Peer engagement + Co-creation	1. Engagement	Cognitive and emotional engagement	Hyper personalization: personalized recommendations based on past orders, reviews, and interactions, food trends. exclusive content like behind-the-scenes videos from popular restaurants, previews of new offerings.
		2. Nudging for content creation	Nudging for active participation	Generation of the content – provide opportunities within the app for self-expression, food critic, sharing recipes, creating crowdsourced menu options, food bundles. first access to limited-time deals. Regular challenges (such as a review-writing contest or a social media photo contest) can drive continuous engagement.
		3. Nudging into co-creation	Gamification, Reinforcing different motivations	Badges and Recognition: Award digital badges or recognition for active peer customers – these badges can unlock special features or discounts, creating a sense of achievement. Leaderboards and Challenges: Introduce gamification elements such as leaderboards where prosumers can see how their contributions (e.g., reviews, referrals, and interactions) stack up against others. These badges can unlock special features or discounts, creating a sense of achievement.
Configuration 1	All above + citizenship behavior	1. Social connection	Provide possibility to connect with other actors	Shared orders: mixed orders, food sharing Beyond platform: cooking classes, food tastings, or “meet the chef” sessions, healthy eating habits sessions, and etc., that allow prosumers to engage with actors beyond platform and just ordering food.

Conversely, for platforms primarily targeting loyal consumers, the focus should remain on maintaining high service quality at every interaction point. However, these platforms should also recognize the limitations of this approach in terms of ecosystem value generation and consider ways to gradually encourage more prosumer-like behaviours among their user bases. The global competitive scenario of OFDPs is extremely crowded, with many brands launching specialist, well-positioned services and generic players working cross-industry. Some of the big players and top of the mind brands globally are McDelivery, Deliveroo, Uber Eats, Foodora, JustEat, Glovo to name a few. In this setup, multihoming is the most frequent consumer behaviour. Platforms strive to retain customers while also trying to gain new ones coming from competing platforms. This research shows that unless platforms would try to develop engagement and strive for long-term relations that will be perceived as transactional brand.

5.2. Theoretical implications

The online food delivery platforms (OFDPs) represent an interesting case for exploring elements of the platform ecosystem. Their business model is in general narrow in scope – restricted to food delivery and these platforms would normally opt for an asset-light model. The platform owner establishes governance rules with the goal of coordination of the diverse actors: prosumers, riders, and their respective communities, partner shops and restaurants, with the goal of value maximization across the ecosystem and growth of the ecosystem through direct and indirect network effects.

First, following (Morgan-Thomas et al., 2020) we adopt the micro-perspective approach to engagement, that breaks with the mainstream tradition to theorize it as a macro-firm interaction. Together with (Morgan-Thomas et al., 2020) we argue that engagement can be conceived through practices of interaction. The socio-technical

perspective allows to conceptualize different form of online and offline interactions. Thus, this paper responds to the calls made by many researchers (Brodie et al., 2019; Lin et al., 2019) to explore empirically emerging shifts in the foci of engagement from dyadic customer-firm (or brand) models to engagement ecosystems – more flexible networks of actors beyond customers – employees, society at large, or friends and family, partners, algorithms, and robots.

The second important theoretical implication is the role of quality in engagement formation and relatedly, the outcomes of the engagement. Unlike traditional businesses, sharing economy platforms at large, or OFDPs specifically, do not have quality assurance procedures put in place. At least, this is true with the services that are provided through ecosystem of peers. Partly, the value generated by the ecosystem are the trust and the quality assurance systems in the form of reviews, comments, referrals and so on. All are outcomes of the prosumer engagement. Non-engaged prosumers would not spend time to answer questions from other users, writing a review or simply rating the quality of service received. It is important to notice that in this setup the role of reciprocity is important. Theories that can potentially be applied in this context are the social exchange theory, social network theory and service ecosystem theory.

Our conceptualization of PE is slightly different from most of conceptualizations of engagement in context of other platforms. In our conceptualization of PE we followed widely agreed approaches by (Hollebeek et al., 2014) and (Vivek et al., 2014). Our findings suggest that socio-cultural aspects may play key differentiator role for these platforms. Food is social experience, it has a variety of social meanings and interaction goals (sharing a meal with friends or families, have a business lunch, dating). Thus, ‘the enhancement of the interaction based on the inclusion of others with the focus of engagement’ (Vivek et al., 2014) is relevant for OFDP.

Finally, current research on service quality business platform in general focuses at customer value extraction and customer perspective mainly, and not interactions among actors in the ecosystem. The focus on interactions is important as taking multi-actor service ecosystem perspective allows us to talk not only consumption and value extraction by customer (which was the mainstream focus of research since many 3-4 decades ago), but also customer contribution to the ecosystem. The customer contribution to the ecosystem is paramount importance for digital platforms – asset light businesses that in their essence orchestrate the ecosystem enabling to generate and distribute value across all actors. For this reason, the focus on customer and not on multi-actor interactions is limited.

We find that consumers are able to distinguish among three types of quality interactions: quality of the digital channel, quality of interaction with riders, quality service recovery – platform responsiveness, co-creation with internal stakeholders, and co-creation with external stakeholders. These interactions represent an important driver of relationships within OFDP ecosystem. As hypothesized, these five dimensions are important as these are reflecting customer perception of the interactive dynamic between the customer and the actors of the platform.

Our contributes to an understanding how these multi-actor actor interactions form a transition in respect to relation formation engagement and relation contribution. However, we see that some customers are happy to contribute to the ecosystem, others refrain from taking this volitional addition to the firm and to the ecosystem. Accordingly, the assumption that co-creation is a natural way of interaction for any customer does not hold true.

6. Conclusions, limitations and future research

The findings suggest the significance of clarifying strategic goals and aligning them with the desired outcomes. The article reveals that, while ensuring excellent service quality is often sufficient to foster customer loyalty, but if assume that the realization of full ecosystem functionality necessitates the consumer engagement and citizenship behavior, platforms need to transform loyal consumers into active loyal prosumers. These prosumers, driven by engagement and citizenship behaviour, play a pivotal role in the functioning of the ecosystem.

The present study despite its rigor has limitations that open door to the new research avenues. First, our findings can be extended. It can be analysed in a broader angle, with a larger and more representative sample including more sectors in order to try a generalization of the model to arrive at the model of prosumer engagement. Second, we studied prosumer engagement, whereas peer-provider engagement might be different conceptually. It quite possible that the antecedents of peer-provider engagement could originate in other service quality attributes and might result in slightly different taxonomy of engagement behaviours. It is important to investigate peer-provider engagement to fully comprehend the phenomenon of prosumer engagement. Third, for the simplicity of the model we limited our data to service quality dimensions where interaction occurs, this model can be extended to include other quality dimensions as well as other constructs, such as emotions, satisfaction, perceived value, trust, and commitment. Finally, customer demographic characteristics might be acknowledged to tune the results of the study and to provide more specific information to practitioners.

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