# The Engagement Process During Value Co-Creation: Gamification in New Product-Development Platforms

*Thomas Leclercq, Ingrid Poncin, and Wafa Hammedi*

ABSTRACT: Academics and practitioners acknowledge the relevance of integrating customers in the development of new products and recommend the use of new technologies to this end. Although they play an important role, the development of online platforms is not sufficient for effective engagement of customers, and yet it is considered a key predictor of successful co-creation initiatives. Despite the large body of research regarding value co-creation, little is known about how to design interactive platforms to engage consumers. To address this gap, this research investigates the impact of two gamification mechanics: cooperation and competition. Based on an in-depth case study including longitudinal data and rich qualitative material, we highlight the existence of four users' profiles and then assess their emotional, cognitive, and behavioral engagement with the gamified co-creation platform over time. We also emphasize the issues that may be induced through gamification.

KEY WORDS AND PHRASES: Co-creation, customer engagement, gamification, new product development, online platforms.

Academics and practitioners acknowledge the relevance of integrating customers in the development of new products or services in innovation and relationship management [9, 45, 72, 84]. Engaging customers in the value co-creation process is advocated as a powerful means of establishing a dialogue with them [90], developing a community around firms' interests [41], strengthening the commitment toward the new offering, and stimulating positive perceptions and attitudes from customers [52, 72, 98], which can boost adoption rates and generally seem to considerably reduce the risk of innovation failure [69, 101]. The emergence of online platforms, communities, and social networks has been widely recognized as facilitating the interactions and exchange of resources among actors [53, 85, 104]. However, even if these platforms play an important role [70], they are not sufficient in inspiring effective customer engagement, though they are considered key predictors of successful co-creation experiences [13, 101]. Consumer engagement (CE) is defined as the level and intensity of the relationship customers develop with a focal object, such as a brand, community, or process [13]. Described as a dynamic and iterative process of interactions, CE generates cognitive, emotional, and behavioral manifestations [13, 44]. Engaged consumers are more willing to promote, advocate, collaborate, and share their knowledge with companies. They also tend to develop long-term relationships with companies [60, 62].

Several authors have noted the key role played by interactive platforms in engaging consumers [8, 51, 74, 85, 86]. Ramaswamy and Gouillart [80] and Storbacka et al. [87] use the term "engagement platform" to describe such online interfaces. The platform design performs a key role in CE because it

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enables firms to provide a compelling co-creation experience to customers and consequently create, maintain, and develop CE [14, 30, 50, 55]. Despite the growing body of research on value co-creation [78, 91] and CE [13, 89, 93], little is known about how to design interactive platforms to engage consumers in the value co-creation process [12, 23, 73]. Recent studies have called for further investigation of mechanisms that could be used to create, maintain, and boost CE [11, 14, 23, 50, 73]. Among the multiple mechanisms that might be implemented to design engagement platforms, managers and researchers have called for the use of gamification [31, 40, 82].

Gamification is defined as "the use of game design elements in non-game contexts" [20, p. 2]. It has recently emerged as a very popular practice that companies use to manage their co-creation platforms to engage customers, especially in online contexts [96, 102, 103]. For instance, Gartner [31, 32] predicted that, in 2015, more than 50 percent of organizations would use gamification to manage their innovation processes and that more than 70 percent of Global 2000 organizations would use at least one gamified application for business purposes. This managerial interest is also reflected in research. Because user experience is at the core of engagement [82], gamification seems to be a fruitful alternative, as it provides users with an enjoyable experience and consequently generates engagement [82, 102]. Gamification has found applications in multiple domains, such as e-commerce [49], health care [25], and intraorganizational management [27].

Whereas game designers predetermine gamification mechanics, which are defined as a game's structure, goals, and rules, the behaviors and emotions that a game generates are difficult to predict. Consequently, the key issue for designers resides in their capabilities to develop mechanics that generate the intended emotions and behaviors [83]. However, despite the increased use of gamification mechanics for the purposes of innovation, it is still unclear how they influence CE [39]. Lucassen and Jansen [64] have called for a better understanding and appropriate management of gamification mechanics. However, the literature related to this emerging concept remains conceptual, and there is a lack of empirical studies analyzing the impact of gamification mechanics on user engagement [39, 82]. Although recent works by Harwood and Garry [40] and Robson et al. [82] have provided some initial valuable insights, they do not consider the heterogeneity of users' profiles and consequently the different reactions users exhibit to a given gamification mechanic. CE is characterized by its intensity and dynamic nature, which cannot be captured by measuring CE at one specific point in time, an approach that has been overused in previous studies [13]. The longitudinal design therefore seems to be more appropriate to better learn about how the intensity of CE evolves over time [13, 43]. Our study aims to address this important gap, and to our knowledge, it is among the first empirical studies to adopt a longitudinal perspective, which is necessary to capture the iterative and dynamic nature of CE [13, 44]. Finally, despite their important contributions, previous studies have devoted considerable attention to the emotional and behavioral manifestations of CE while overlooking the cognitive dimension, which remains an important aspect, especially in the specific context of new product development (e.g., [92, 95]).

To address these gaps, our research attempts to offer a more fine-grained understanding of the role that gamification mechanics plays in engaging actors in co-creation platforms. In particular, with this study, we seek to investigate the following questions:

- How can users be profiled based on their behaviors on a gamified co-creation platform?
- How do users' profiles predict current and future users' emotional, cognitive, and behavioral engagement?

Multiple gamification mechanics exist, but in this study, two of them—cooperation and competition—will be studied deeply. In an innovation context, these two mechanics are widely used to design online co-creation platforms [16, 30]. The competition mechanic consists of one player or group winning and the others losing, whereas the cooperation mechanic relies on players collaborating to achieve a common goal [96]. To empirically address the aforementioned questions, we use an in-depth case study, including longitudinal data and rich qualitative material. We first highlight the existence of multiple user profiles. We then assess users' emotional, cognitive, and behavioral engagement with the gamification mechanics used, competition, and cooperation mechanics. Our study contributes to the extant literature by emphasizing four user profiles, that is, invisible users, competitors, cooperators, and coopetitors. Furthermore, adopting a longitudinal perspective helps us better capture the dynamics of CE over time across the various profiles and to study their respective reactions to the gamification mechanics.

## Theoretical Background

### *Customer Engagement*

The concept of customer engagement (CE) lies within the broader domain of relationship marketing (RM) [93]. Indeed, a large part of RM focuses on customer behaviors that result from positive experiences and eventually lead to customer loyalty [22, 79]. However, in addition to this approach, the CE concept also includes customer relationships beyond transactions, that is, when customers do not purchase or plan their purchases [93]. Consistent with this approach, van Doorn et al. [89] defined CE as "the customers' behavioral manifestation toward a brand or firm, beyond purchase, resulting from motivational drivers." These manifestations include actions such as generating positive word of mouth, making recommendations, and supporting other customers.

To extend the scope of this definition focusing on customers' behaviors, Brodie et al. [13] performed an extensive analysis of the literature and defined CE as "a psychological state that occurs by virtue of interactive, co-creative customer experiences with a focal agent/object (e.g., a brand) in focal service relationships" [p. 260]. The authors describe CE as a dynamic and iterative process of interactions encompassing cognitive, emotional, and behavioral

manifestations [13, 44]. The cognitive dimension refers to the level of customer concentration toward the engagement focal object. The emotional dimension includes customers' sense of belonging to the brand, organization, or community. Finally, the behavioral dimension encompasses two subdimensions. First, the vigor refers to a customer's energy level and mental resilience in interacting with the engagement focal object. Second, the interaction level reflects the two-way communication intensity [13]. The iterative nature of the process implies that relational concepts such as commitment, trust, self-brand connection, or loyalty may act as antecedents and consequences of CE [13, 52].

Within virtual contexts, the CE concept particularly provides a useful means of understanding how firms and customers interact to co-create value [11, 87]. According to Kuo and Feng [61], who studied virtual interactive consumer experiences, four categories of value can be derived from CE. First, the learning or cognitive value refers to the knowledge and information that customers can obtain from their interactions [21, 70]. Second, social values encompass improvements in social relationships, with other actors (firms or other customers) taking part in the interactions [70, 100]. Third, the self-esteem values reflect the enhancement of the reputation and status that can be derived through the interactions [21, 70, 100]. Fourth, the hedonic values characterize the pleasure resulting from interacting with other people [21, 70]. Consequently, by engaging their resources (time, knowledge, or social capital) in the innovation platform, customers generate multiple types of value for themselves. Therefore, they become part of a value co-creation process [78] in which they interact to provide resources, integrate the resources provided by others, and generate their own value [4, 35, 36].

### *Gamification*

During the past decade, the use of game design elements rapidly began to be used by practitioners to design nongame context and for marketing purposes [20, 48, 102]. This enhancement of the customer experience with game-related elements has been referred to as gamification. Gamification has already been applied in several areas, including community management (Create and Share from Lego) and health care (Nike Plus), and even in tools that allow people to track their life aspirations (Mindbloom) [38, 103]. In the research community, the current attention dedicated to gamification management results from the growth and importance of the computer-based game industry, which has led researchers and practitioners to pay ample attention to developing theories for and an understanding of what makes games engaging [82]. Subsequently, authors have considered the potential benefits that these theories can bring to achieve business objectives, such as engaging customers and providing a compelling experience [96, 103]. Therefore, gamification has found applications in multiple domains, such as e-commerce [49], innovation [28, 30], and intraorganizational management [27]. Moreover, some authors have underscored the interest in using gamification practices in marketing by highlighting their positive effects on the online retail experience [38].

Gamification is defined in two different ways—from the perspective of game designers or from the perspective of users. The systemic perspective defines gamification as "the introduction of game mechanics and elements (rather than full-fledged games) to design non-game contexts" [20, p. 2]. These practices aim at sustainably inducing customers' behaviors in favor of the companies' activities [96, 103]. This definition distinguishes gamification from closed concepts such as serious games [1] or in-game advertising [99], in which elements and mechanics related to the nonentertainment process—learning or advertising—are used within full-fledged games. In line with this approach, Werbach and Hunter [96] described gamification as making activities more gamelike. More recently, the user perspective has defined gamification as "a process of enhancing a service with affordances for gameful experience to support users' overall value creation" [48]. This users' perspective highlights the experience that gamification is attempting to provide and notes that a gameful design is not always obtained by concrete elements but rather results from the experience that is lived by users [49]. Regarding these approaches, gamification may be considered through a game designer's perspective as game mechanics introduced in a nongame context to influence users' behaviors and through the users' perspective as an experiential dimension lived by individuals.

Previous authors have highlighted the positive effects of gamification on attitude [24], lived experience [82], and enjoyment of and engagement in the gamified activities [40, 97]. However, although gamification practices can be considered a lever for companies to guide consumers' actions and emotions, Lucassen and Jansen [64] and Werbach and Hunter [96] both emphasize the need for practitioners to properly understand and manage the gamification mechanics and to not apply these practices for themselves.

To understand gamification practices, Robson et al. [83] suggested the mechanics dynamics emotions framework (MDE), which was adapted from the game design literature [47]. The authors identified three components of gamification practices—mechanics, dynamics, and emotions. The mechanics include the goals, rules, setting, types of interactions, and boundary of the situation to be gamified. These elements depend exclusively on designers' decisions and do not change from one user to another or across time [83]. Dynamics are behaviors and interactions that emerge from customers' gamified experience [17]. They encompass both desired behaviors (e.g., cooperation among users or better contributions) and unintended behaviors (e.g., cheating) [26]. Finally, the emotional components include the positive and negative affective reactions induced by the gameplay [83]. Therefore, MDE encompasses both game designers' and users' perspectives because it includes the game design imposed by the company's designers and the users' reactions.

Adopting the MDE framework, Harwood and Garry [40] have recently highlighted the impact of gamification mechanics on emotional and behavioral engagement and have noted relational outcomes such as trust and commitment, but they did not consider the cognitive outcomes generated. Furthermore, the authors considered the users to be a homogeneous group reacting similarly to the gamification mechanics. Several studies from the literature regarding game design [6, 7], online community marketing [58, 59], and innovation [16, 46, 94]

have emphasized the existence of multiple user profiles. Therefore, we need to investigate these profiles and assess how they interact and engage within a gamified value co-creation platform. Finally, because CE is a dynamic and iterative process, we need to capture its evolution over time according to each user profile.

## Research Context

To identify user profiles and assess the intensity and level of users' engagement, an in-depth case study method was used. An extensive analysis of a co-creation platform was conducted. Launched in 2013, this platform is becoming increasingly popular in France, and it has resulted in six innovative projects being listed for sale in the first year of activity. The platform's main objective is the development of innovative products and/or services to revitalize French industry. These innovative projects vary from day-to-day products (e.g., customizable flip-flops) to very technical projects (e.g., alternative energy sources). On this platform, individuals are invited not only to submit their ideas but also to vote for and enrich ideas suggested by others. The platform enables users to jointly develop their innovations at every stage, from idea generation to product launch. Every three months, a committee votes on ideas that they believe deserve further development. As depicted in Figure 1, process, idea, or design submissions are rewarded through competitive mechanics (i.e., only winning users are rewarded for their contributions). Writing reviews of others' ideas or voting for a project are rewarded through cooperative mechanics (all users are rewarded for their contributions). The rewards consist of a percentage of the profits generated through the sale of the products and services created. Whereas idea submissions and writing of reviews result in rewards with a high expected value, naming proposals and votes offer lower rewards. For instance, submission of ideas is rewarded by 25 percent of the profits generated from the sale of products or services created based on the idea submitted. However, to receive

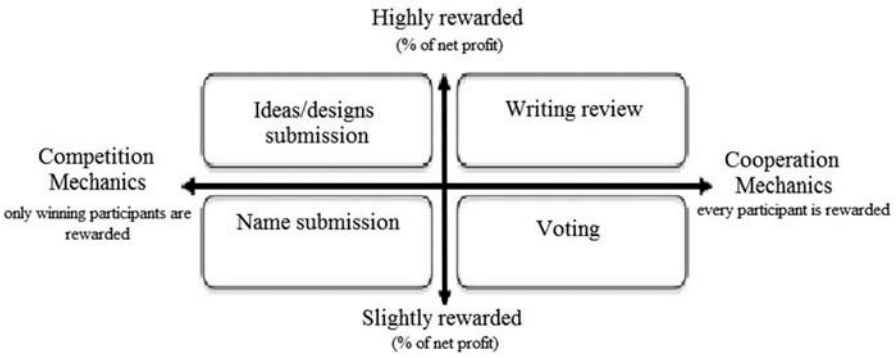


**Figure 1. Gamification Mechanics and Level of Reward According to the Contributions**

the reward, the idea needs to win a selection contest managed through a competition mechanic. By contrast, when users vote, they unconditionally share with the other voters 5 percent of the profits generated through the sale of products or services created based on the idea they voted for. In exchange for participants' ideas and contributions, the company establishes contacts with industries, supports prototyping activities, and finds funding alternatives.

As displayed in Figure 2, in addition to a thorough literature review, multiple types of qualitative and quantitative data were gathered. Longitudinal data were extracted, including all the contributions, submissions, votes, or comments made by all platform members over a period of six months. We then performed our analysis following two steps. First, we identified user clusters according to users' behaviors and qualified the profiles. Then we assessed the intensity of the cognitive, emotional. and behavioral engagement for the various profiles and studied their evolution over time. Based on this analysis, we linked and embedded our findings with multiple theories from social psychology, game studies, and marketing. In the following sections, we describe each step, including the research design used and the findings derived from the analysis.

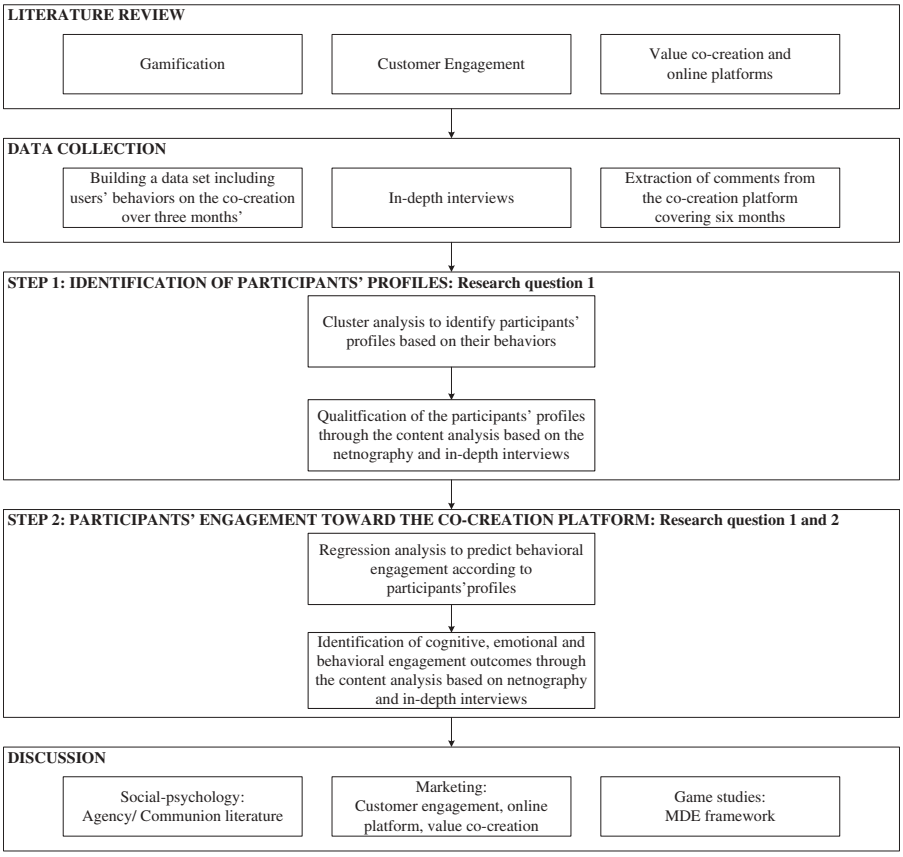


**Figure 2. Research Design**

## Step 1: Identification of User Profiles

### *Methods*

#### *Cluster Analysis*

Our initial data set included 455 individuals' behaviors covering six months of activity on the platform. Because the users were not registered at the same time on the co-creation platform, we created a data set that standardized observations in terms of the first month of activity. This data set includes 234 users for whom we captured the first month of activity. This allows the evolution of users' behaviors on the platform to be analyzed based on their entries. In this manner, we obtained monthly data, including five variables characterizing users' contribution to the co-creation platform. First, the number of submitted ideas refers to the innovations suggested by users. These innovations take the form of innovative device drawings, pictures of prototypes, or in-depth descriptions of potential projects. Second, the submitted designs reflect the number of times a user suggests particular designs for ideas proposed by other contributors. This includes schemas of future products, colors, and device shapes. Third, users are invited to propose names and advertising slogans that could be used to sell the innovations. Fourth, users are encouraged to vote for ideas that they or others have submitted. These votes take the form of a like button on each project. The number of likes influences the experts' decision to select specific projects for further development. Finally, users may comment on projects submitted by others or on their own projects. These comments result in project improvements, debates about the relevance of the submitted ideas, and interactions among users. A first exploration of these data revealed that the preceding three months included in our data set exhibited an insignificant activity level. Therefore, we focused our analysis on the first three months of user activity on the co-creation platform. Consequently, our data set consists of five variables that describe users' monthly behaviors on the co-creation platform in their first, second, and third months of activity.

According to Dejean and Jullien [19], the first contributions on an online platform are a good predictor of subsequent behaviors. Therefore, to identify users' profiles, we performed a cluster analysis based on the five variables characterizing users' behaviors during their first month of activity. Cluster analysis is a purely empirical method of classification that uses an inductive technique. This statistical procedure consists of dividing respondents into groups that exhibit similarities (in our case, similarities in terms of behaviors). To distinguish the groups, we applied hierarchical cluster analysis. Because this method does not require a priori specification of the number of clusters that should be created, it enables us to identify the multiple groups as they emerge from the data. Within this approach, we adopted Ward's method, a widely used measure of similarity [37].

### *Netnography and In-Depth Interviews*

The groups emerging from the cluster analysis provided the basis to properly identify the profiles interacting on the co-creation platform. Through our collaboration with the co-creation platform's managers, we followed each contributor's activities (through his/her logins) and conducted netnography to qualify these profiles. Introduced in the late 1990s, netnography is a qualitative research method that adopts ethnographic research techniques to analyze online interactions [56, 57]. Adopted by a number of researchers investigating consumers' online discussion and behaviors, this method offers the opportunity to gain an understanding of online community functioning [14, 41, 54, 77].

As suggested by Kozinets [58], this work applied a multimethod approach to study the online content by conducting in-depth interviews and analyzing posted comments. First, we observed users' dialogues and behaviors on the platform. To do so, we followed the platform activity daily during a six-month-period and collected 2,174 comments. We then conducted in-depth interviews with nine users. As depicted in Table 1, we selected these users to interview both newcomers who recently registered on the platform and people who had been active for a longer period, that is, those who had registered on the platform more than one month and up to one year prior. The selection also took into account the main activities of interviewees on the co-creation platform. Indeed, these respondents included users who primarily submitted ideas and users who interacted with others, voted, or simply observed the activity on the platform. The nine interviewed users covered the four emerging clusters and included newcomers and users who had been registered for months. These interviews focused on the meanings users ascribe to their experiences within the co-creation platform and provided internal validity to our work through data triangulation [18]. An interview guide was prepared to provide directions for the semistructured interviews. Each of these interviews lasted an average of one hour. All interviews were audio-recorded and transcribed (a total of 35,787 words). The data collection, netnography, and in-depth interviews continued until theoretical saturation was reached [33], that is, no new materials emerged through continued investigation.

**Table 1. Interviewees' Description.**

| Interviewee | Registered for | Age (years) | Main activity on the platform |
|---|---|---|---|
| Interview 1 | 1 month | 25 | Submit ideas |
| Interview 2 | 1 month | 47 | Interact and submit ideas |
| Interview 3 | 2 months | 28 | Interact and submit ideas |
| Interview 4 | 2 months | 27 | Interact and submit ideas |
| Interview 5 | 8 months | 29 | Submit ideas |
| Interview 6 | 10 months | 50 | Interact and submit ideas |
| Interview 7 | 10 months | 31 | Submit ideas |
| Interview 8 | 11 months | 32 | Vote and interactions |
| Interview 9 | 12 months | 58 | Buy cocreated products and follow platform activities |

We coded and categorized all comments and interviews. We analyzed qualitative materials with open coding to identify the different types of responses or themes that appeared [67]. We then engaged in a process of axial coding to identify common patterns and connections among codes [67]. To triangulate our findings, three authors specializing in distinct marketing fields (digital marketing, service innovation, and retailing) interpreted the qualitative materials [15]. Through discussions among the authors, we reached a consensus and ensured that each factor or theme repeatedly appeared in the data to achieve concept saturation [33]. After successive readings and discussions among the authors, the researchers agreed on the codes used and their interpretations.

## Findings

Among the multiple clustering alternatives available, we chose the solution of four clusters because it provided the minimum number of clusters that satisfied the cubic cluster criterion (> 2) and $R^2$ (> 0.5). Table 2 summarizes each cluster's information. The first cluster includes 164 members who exhibited few activities on the co-creation platform. This large number of inactive users is consistent with the previous literature regarding online community functioning, which highlights that only a small part of a community acts and/or interacts on co-creation platforms [58]. The second cluster gathers 37 members whose activities consist mainly of idea and design submissions (1.19 ideas/month and 0.24 designs/month). The third cluster encompasses 13 users whose activities consist mainly of voting for submitted ideas (50.61 votes/month) and suggesting names and slogans for submitted ideas (6.15 names/month). The fourth group includes 20 members who make a significant number of comments (5.1 comments/month) and submit a large number of ideas (0.3 ideas/month).

In addition to the cluster analysis, the netnography approach helps qualify the four emerging profiles. Indeed, netnography is an effective tool for examining the behavioral patterns of online user groups [53], which is our aim because we intend to understand the behavior of the four emerging profiles, each of which represents a subgroup of the co-creation platform users. The content analysis of the comments and the in-depth interviews converged to 11 emerging codes related to the profiles' qualification and the elements they value on the co-creation platform. The codes presented in Table 3 have been classified in three categories: gamification mechanics, users' motives, and the elements users consider valuable in the co-creation platform. Based on the qualitative and quantitative methods

**Table 2. Cluster Analysis Results: Average Contribution per Month.**

| | # members | #ideas | #comments | #votes | #designs | #names |
|---|---|---|---|---|---|---|
| Invisible user | 164 | 0 | 0.57 | 2.59 | 0 | 0.23 |
| Competitor | 37 | 1.19 | 0.30 | 1.40 | 0.24 | 0.32 |
| Cooperator | 13 | 0.15 | 0.08 | 50.61 | 0 | 6.15 |
| Coopetitor | 20 | 0.30 | 5.10 | 6.25 | 0 | 1.00 |

**Table 3. Content Analysis Results.**

| Categories | Codes | No. of times this code appears in the netnography | No. of times this code appears in the interviews |
|---|---|---|---|
| Gamification mechanics | Competition | 9 | 7 |
| | Cooperation | 10 | 11 |
| | Win state | 14 | 11 |
| Users' motives | Commercialization | 7 | 12 |
| | Community | 30 | 6 |
| | Collaboration | 27 | 13 |
| | Discover | 4 | 10 |
| Purposes that users value | Duration of participation | 5 | 0 |
| | Users' skills | 2 | 5 |
| | Platform global objective | 29 | 5 |
| | Ideas quality | 0 | 7 |
| Positive user engagement | Cognitive (idea emulation) | 13 | 8 |
| | Behavioral (establish ideas) | 19 | 7 |
| | Behavioral (attract people) | 33 | 5 |
| | Behavioral (further contributions) | 30 | 6 |
| | Emotional (excitement-happiness) | 4 | 5 |
| Negative user engagement | Cognitive (rejection of submitted ideas) | 105 | 3 |
| | Behavioral (sabotage) | 42 | 1 |
| | Behavioral (disengagement) | 6 | 8 |
| | Emotional (anger and deception toward competition mechanics) | 27 | 3 |

used, we provided additional details regarding the four user profiles identified through the cluster analysis.

The first group represents a large portion of the platform members ($n$ = 164) but exhibits only a lower level of activity regardless of the nature of the contribution. Described by Robson et al. [82] as spectators, these users observe the interactions on the platform without being part of it. However, their engagement is real, even if it is not visible from their behaviors [14]. Indeed, they navigate on the platform, sometimes daily, and follow the debates and novelties. In this manner, they interact with the platform even if their contributions are not as visible as those of other users. Therefore, we refer to these users as invisible users. As illustrated by the following extract from one of the interviews, invisible users are motivated by the curiosity that they satisfied by exploring, following debates and discovering others' submissions and projects.

> I like to go on the website and discover the submitted ideas. I think they are great! I do it every day. It is impressive to see the number of ideas that are submitted. Ideas come from all sides. (Interview #4)

The second group of behaviors mainly consists of activities that are highly rewarded by competition mechanics, such as idea or design submissions. We call the users who predominantly exhibit such behaviors competitors. They want to be recognized for their skills, such as their ability to generate creative and profitable ideas. They reject the community mindset, which they consider cronyism. Indeed, they think that this sense of community could lead to privileged relationships or friendship among community members, which risks becoming a source of bias when members evaluate and judge others' projects. Competitors register on the co-creation platform to commercialize their already well-designed projects. They refine their concepts until they are convinced that they are sufficiently elaborated to win the competition and be selected by experts for further development. The following interviewee's statement illustrates this observation:

> I have been working on this project for roughly 5 years. I wanted to apply for a patent. However, as I do not have enough financial resources to make my project come true, I am seeking out this platform for that reason. (Comment #283)

The third cluster mainly submits names and votes. These slightly rewarded activities are managed by competition and cooperation mechanics, respectively. Therefore, individuals included in this cluster act independently of the gamification mechanics applied. Rather, they value the final objective of the co-creation platform and aim to sustain and develop the related community. These users consider this community as having a transcendent role in society, such as promoting the economy or creating future innovations. They register on the platform to be part of a community and collaborate on common projects. Because these users perceive themselves as members of the community and mainly act to further improve others' projects, we refer to them as cooperators. In contrast to competitors, they legitimize users who have been registered for a long time on the platform. The following comment illustrates the motivation underlying cooperators' behaviors on the platform:

> We are registered to this platform to work together and enhance things. (Comment #1601)

Finally, the last group gathers twenty members. However, these members are the most active users on the co-creation platform because they not only submit ideas but also comment on and review others' projects. Driven by cooperation and competition mechanics, they use the cooperation mechanics to create social bonds with other users. For them, this behavior is a type of strategy that aims to stimulate participation in their own projects and allows a sufficient level of quality to be reached to compete with other users. We describe these users as

coopetitors. They value long-term engagement on the co-creation platform and recognize the importance of users' skills. Previous literature characterizes coopetitors as a hybrid profile between competitors and cooperators [10]. Nevertheless, the following interviewee's statement illustrates that coopetitors remain a distinct profile that perceives the complementarity between competition and cooperation mechanics as necessary for the co-creation platform.

> I'm disappointed that members have difficulties understanding that submitting an idea on this platform is a matter of competition between members. It is a competition enabling the community to develop the best product to succeed on the market. (Interview #1)

By applying competition and cooperation mechanics with different levels of rewards, the co-creation platform attracts multiple profiles that behave according to different motives. Competitors are driven by competition mechanics and are highly rewarded. Coopetitors use both mechanics as long as they are both highly rewarded and enabled to develop their own project. Cooperators are driven by neither cooperation nor competition mechanics; rather, they value the platform's final objective and the opportunity to build a community mindset around their interests. Although these profiles interact on the co-creation platform, their expectations and behaviors differ. Therefore, conflicts emerge from their interactions, which affects their engagement. Because we are seeking to assess the level and intensity of user engagement and capture its evolution, we need to adopt a longitudinal perspective and examine how the engagement of the identified profiles evolves over time. The second step of this study addresses this purpose.

## Step 2: Users' Engagement on the Co-creation Platform

### *Methods*

#### *Regression Analysis*

Multiple regression analyses were applied to predict users' first, second, and third months of behavioral engagement based on their profiles. Therefore, we used the customer engagement value (CEV) metrics suggested by Kumar et al. [60] to capture customer lifetime vValue (CLV), customer knowledge value (CKV), customer influence value (CIV), and customer referral value (CRV).

CLV represents the customer's future profitability via the co-creation platform over his/her entire lifetime. CRV is defined as the extent to which customers can engage other customers toward the platform. CIV refers to the influence an individual exerts on other customers' or prospects' behaviors. It indicates the strength of ties customers generate in a group, network, or community. Finally, CKV includes the feedback and knowledge that customers provide to the community regarding innovation and improvement of existing products or services. For each of these dimensions, we used proxy variables.

CLV was evaluated through the duration of members' activity on the platform. CRV was measured through the number of reviews submitted by users on others' projects. CIV was assessed through the number of votes that users posted for others' projects. Finally, CKV was evaluated using a score that reflected the number of ideas, names, and designs submitted. For the analyses, the CIV, CRV, and CKV scores were calculated for the first, second, and third months of users' activity. The CLV score was only calculated in the first month, as it does not vary over time.

For each month, three regressions were applied using the CKV, CIV and CRV metrics as the dependent variables, and the regression on the CLV score was performed based on the first month. We thus obtained ten regressions. The independent variables were developed based on the clusters' membership. Cluster dummy codes were constructed, and people who exhibited no activity were not categorized in a cluster but rather were used as the referent category in regression models. These regressions aimed to show how users' behavioral engagement evolves over time according to their profiles. We also introduced the remaining CEV metrics of the studied period in the regressions to note the many dynamics that may exist between the three CEV components: CRV, CKV, and CIV. Understanding how these CEV components related to one another was necessary to properly identify the segments that ultimately maximize CEV [60]. These metrics were standardized to model users' behavioral engagement regardless of the original scale of the data, and they assessed the deviations from the CEV mean scores for each month.

Preliminary tests were conducted. The correlation matrix and VIF analysis were checked to assess collinearity. The statistics displayed in Tables 4 and 5 indicate acceptable levels of collinearity among the CIV, CRV, and CKV variables over the three months; in addition, no evidence of autocorrelation was found (except for the CLV score). The emerging models revealed an *R*-squared between 0.45 and 0.69 for the first month (except for CLV, with an *R*-squared of 0.13), between 0.26 and 0.37 for the second month, and between 0.25 and 0.51 for the third month.

### *Netnography and In-Depth Interviews*

In addition to using qualitative methods to qualify emerging clusters, we investigated users' emotional, cognitive, and behavioral engagement adopting the same approach. Netnography and in-depth interviews provide understanding regarding users' behavioral engagement highlighted by the results from the multiple regression analysis and provide insights on users' emotional and cognitive engagement according to the profiles. However, to lend nuance to our findings, we distinguished the positive and negative outcomes resulting from users' engagement. As indicated in Table 3, netnography and in-depth interviews converged to result in nine emerging codes that reveal both positive and negative outcomes derived from users' emotional, cognitive, and behavioral engagement with a gamified co-creation platform.

**Table 4. Regression Analysis Results.**

| | | Dependent Variables | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | First month | | | | | | | | | | | |
| | | CLV | | | CKV1 | | | CRV1 | | | CIV1 | | |
| | | β1 | Tolerance | VIF | β1 | Tolerance | VIF | β1 | Tolerance | VIF | β1 | Tolerance | VIF |
| **Independent Variables** | **Constant** | 1.015** | – | – | -0.25** | – | – | -0.276** | | | -0.163* | – | – |
| | **Cooperator** | 0.818** | 0.952 | 1.051 | 1.503** | 0.544 | 1.837 | -0.786* | 0.499 | 2.003 | 3.788** | 0.873 | 1.145 |
| | **Coopetitor** | 1.048** | 0.938 | 1.066 | -0.277 | 0.315 | 3.175 | 3.661** | 0.857 | 1.166 | -0.534 | 0.316 | 3.161 |
| | **Competitor** | 0.404* | 0.894 | 1.118 | 2.657** | 0.881 | 1.135 | -0.449* | 0.347 | 2.878 | 0.615* | 0.348 | 2.874 |
| | **Invisible** | 0.298** | 0.842 | 1.188 | -0.81 | 0.757 | 1.321 | 0.402** | 0.837 | 1.197 | -0.008 | 0.754 | 1.326 |
| | **CKV1** | – | – | – | – | – | – | 0.259** | 0.355 | 2.819 | -0.245** | 0.341 | 2.938 |
| | **CRV1** | – | – | – | 0.282** | 0.325 | 3.077 | – | – | – | 0.294** | 0.317 | 3.157 |
| | **CIV1** | – | – | – | -0.152** | 0.553 | 1.81 | 0.166** | 0.559 | 1.788 | – | – | – |
| | **$R^2$** | 0.135 | | | 0.671 | | | 0.699 | | | 0.468 | | |
| | **Adjusted $R^2$** | 0.124 | | | 0.665 | | | 0.693 | | | 0.458 | | |
| | **ANOVA statistics** | 12.901** | | | 112.278** | | | 127.54** | | | 48.392** | | |
| | **Durbin–Watson test** | | | | 1.839 | | | 1.799 | | | 1.921 | | |

*$p < 0.05$; **$p < 0.001$.

*(continues)*

**Table 4. Continued**

| | | Dependent Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Second month | | | | | | | | |
| | | CKV2 | | | CRV2 | | | CIV2 | | |
| | | β2 | Tolerance | VIF | β2 | Tolerance | VIF | β2 | Tolerance | VIF |
| **Independent Variables** | **Constant** | 0.008 | – | – | -0.095 | | | -0.09 | – | – |
| | **Cooperator** | -0.083 | 0.741 | 1.35 | -0.242 | 0.743 | 1.346 | 2.528** | 0.951 | 1.052 |
| | **Coopetitor** | -0.442 | 0.839 | 1.192 | 1.311** | 0.926 | 1.08 | 0.088 | 0.831 | 1.204 |
| | **Competitor** | 0.42* | 0.888 | 1.126 | 0.005 | 0.872 | 1.147 | -0.053 | 0.872 | 1.147 |
| | **Invisible** | -0.054 | 0.84 | 1.191 | 0.098 | 0.842 | 1.188 | 0.002 | 0.839 | 1.192 |
| | **CKV2** | – | – | – | 0.487** | 0.942 | 1.061 | 0.059 | 0.697 | 1.434 |
| | **CRV2** | 0.538** | 0.853 | 1.172 | – | – | – | 0.162* | 0.644 | 1.553 |
| | **CIV2** | 0.056 | 0.74 | 1.352 | 0.136* | 0.754 | 1.326 | – | – | – |
| | **$R^2$** | 0.305 | | | 0.371 | | | 0.263 | | |
| | **Adjusted $R^2$** | 0.292 | | | 0.359 | | | 0.249 | | |
| | **ANOVA statistics** | 24.14** | | | 32.382** | | | 19.615** | | |
| | **Durbin–Watson test** | 1.89 | | | 1.966 | | | 1.945 | | |

*$p < 0.05$; **$p < 0.001$.

*(continues)*

**Table 4. Continued**

| | | Dependent Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Third month | | | | | | | | |
| | | CKV3 | | | CRV3 | | | CIV3 | | |
| | | β3 | Tolerance | VIF | β3 | Tolerance | VIF | β3 | Tolerance | VIF |
| **Independent Variables** | **Constant** | -0.025 | – | – | -0.069 | – | – | -0.27 | – | – |
| | **Cooperator** | 0.041 | 0.866 | 1.155 | -0.251 | 0.869 | 1.151 | 0.995** | 0.922 | 1.085 |
| | **Coopetitor** | 0.781* | 0.855 | 1.169 | 1.054** | 0.895 | 1.117 | -0.499* | 0.845 | 1.183 |
| | **Competitor** | 0.025 | 0.881 | 1.135 | 0.33* | 0.894 | 1.119 | -0.139 | 0.884 | 1.132 |
| | **Invisible** | -0.038 | 0.84 | 1.19 | -0.006 | 0.84 | 1.191 | 0.065 | 0.841 | 1.189 |
| | **CKV3** | – | – | – | -0.006 | 0.747 | 1.384 | 0.302** | 0.867 | 1.153 |
| | **CRV3** | -0.008 | 0.563 | 1.776 | – | – | – | 0.53** | 0.833 | 1.201 |
| | **CIV3** | 0.461** | 0.567 | 1.762 | 0.611 | 0.722 | 1.384 | – | – | – |
| | **$R^2$** | 0.253 | | | 0.437 | | | 0.512 | | |
| | **Adjusted $R^2$** | 0.24 | | | 0.427 | | | 0.503 | | |
| | **ANOVA statistics** | 18.664** | | | 42.679** | | | 57.599** | | |
| | **Durbin–Watson test** | 1.963 | | | 2.166 | | | 1.804 | | |

*$p < 0.05$; **$p < 0.001$.

**Table 5. Correlation Matrix.**

| | | First month | | | | Second month | | | Third month | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLV | CKV | CIV | CRV | CKV | CIV | CRV | CKV | CIV | CRV |
| **First month** | CLV | 1 | | | | | | | | | |
| | CKV | 0.164 | 1 | | | | | | | | |
| | CIV | 0.225 | 0.017 | 1 | | | | | | | |
| | CRV | 0.263 | 0.167 | 0.11 | 1 | | | | | | |
| **Second month** | CKV | 0.19 | 0.096 | 0.056 | 0.11 | 1 | | | | | |
| | CIV | 0.326 | 0.023 | 0.7 | 0.07 | 0.149 | 1 | | | | |
| | CRV | 0.367 | 0.111 | 0.089 | 0.388 | 0.526 | 0.199 | 1 | | | |
| **Third month** | CKV | 0.208 | 0.005 | 0.159 | 0.144 | 0.226 | 0.403 | 0.073 | 1 | | |
| | CIV | 0.421 | 0.042 | 0.441 | 0.13 | 0.233 | 0.818 | 0.275 | 0.474 | 1 | |
| | CRV | 0.397 | 0.172 | 0.16 | 0.208 | 0.582 | 0.466 | 0.593 | 0.324 | 0.614 | 1 |

## *Results*

### *Behavioral Engagement Outcomes*

Figures 3, 4, and 5 show the global users' churn rate that appears over time for each behavioral engagement metric considered. However, the multiple regression analysis highlights an important difference in the levels of the CEV dimensions—CLV, CKV, CRV, and CIV—among the four user profiles. Furthermore, the evolution of users' level of engagement also varied across time. The results of the multiple regressions capturing the longitudinal perspective of users' engagement are summarized in Table 4. The results yielded by this quantitative analysis are enriched by the insights derived from the content analysis.

First, CLV refers to the activity duration. As indicated by Figure 6, even if there is an intense decrease of activity during the first months for all users, the cooperators and coopetitors exhibit longer activity on the co-creation platform (on average, 1.8 and 2 months, respectively) than competitors and invisible users (on average, 1.4 and 1.3 months, respectively). Therefore, whereas competitors seem to be valuable short-term partners, cooperators and coopetitors exhibit more persistent engagement in the longer term. As expressed by the following comments, the cooperators and coopetitors legitimize users when they are registered for a long time:

> I invite you, if you have time and because I see that you have been registered for only one week and consequently have not followed what happens during the past year, to go and see the ideas that have been preselected, the number of votes, and the comments. When you have performed it, go and see commenters' names and then record their data, their contributions and their great constructive comments. When you have performed that, see when they were connected for the last time and you will understand that comments coming from BJ, Arnaud and myself are based on their knowledge of the platform resulting from long-term participation. (Comment #2)

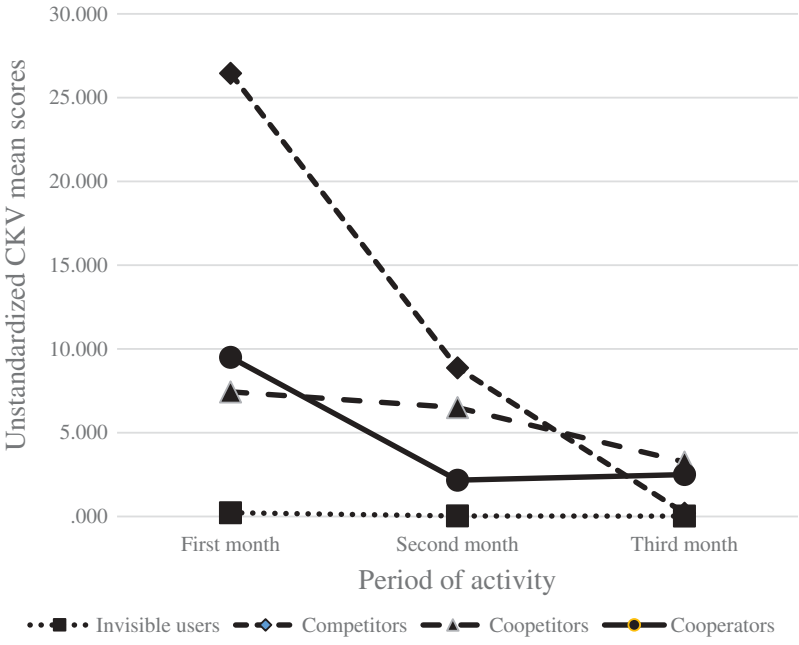


**Figure 3. Unstandardized CKV Mean Scores According to User Profile**

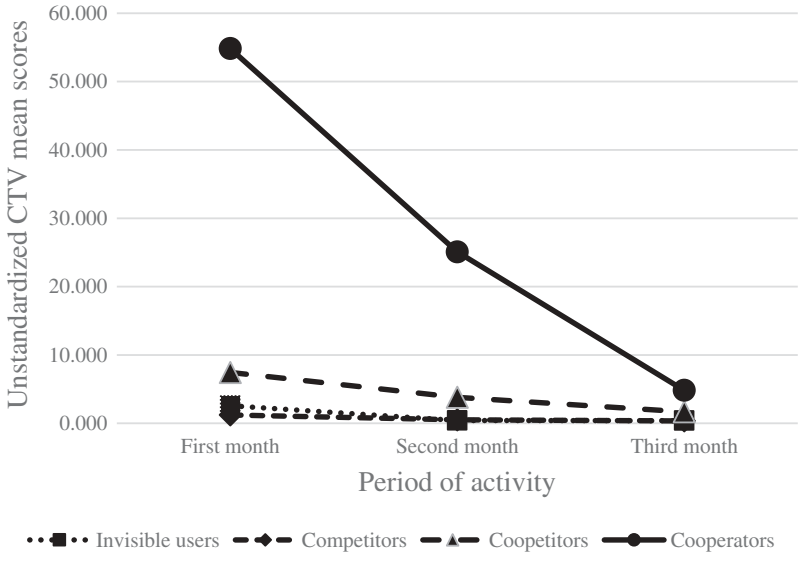


**Figure 4. Unstandardized CIV Mean Scores According to User Profile**

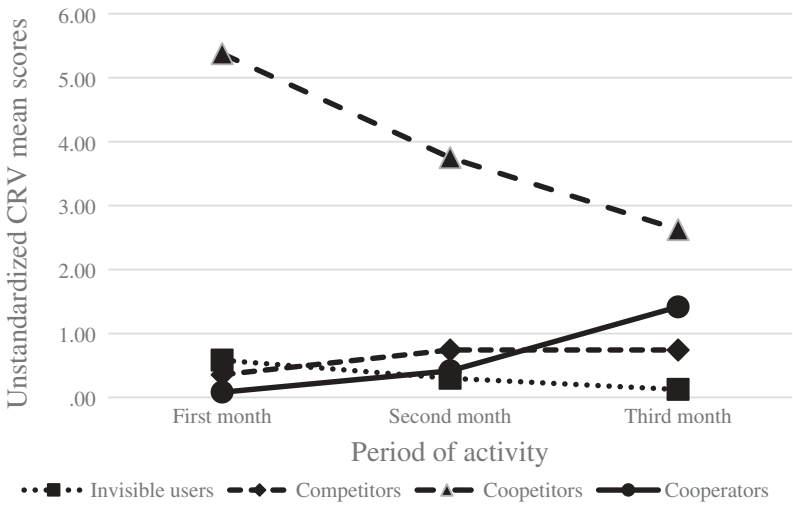


**Figure 5. Unstandardized CRV Mean Scores According to User Profile**

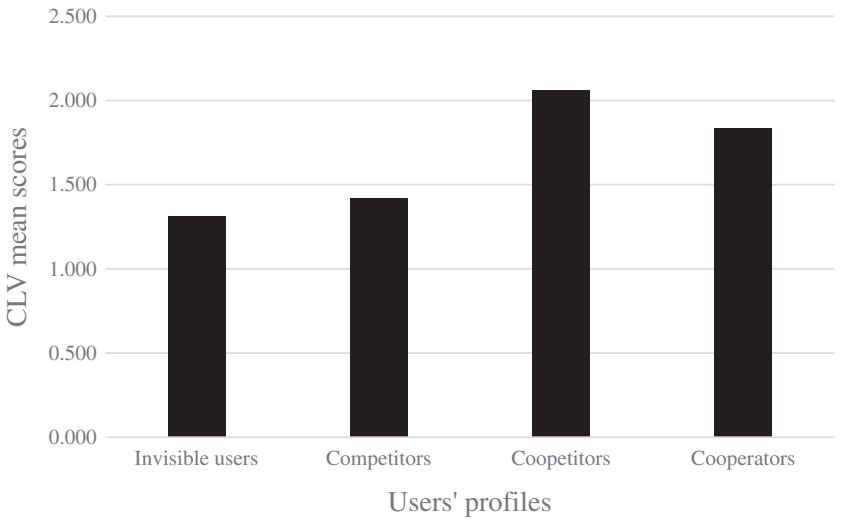


**Figure 6. CLV Mean Scores According to User Profile**

> I think the users' integration in the community and its functioning require time. (Comment #379)

By contrast, competitors' participation depends on the extent to which they perceive themselves as able to win the competition. If the community rejects their ideas, then they consider the likelihood of commercializing their projects as decreasing; after a while, they start doubting the platform's

functioning and tend to disengage from it. For example, one of the interviewees described his feelings after having received negative feedback from the community:

> I connected myself when I posted ideas. I was regularly connected to see what users' mindset was. Then, I never visited the platform because I think that there is no chance for one of my projects to be selected, produced and sold. (Interview #1)

Second, Table 4 shows that competitors and cooperators exhibit a higher level of CKV during the first month of activity (with, respectively $\beta = 2.657$; $p$-value = 0.003 and $\beta = 1.503$; $p$-value = 0.000), but it quickly decreases during the second month to a nonsignificant level for cooperators and a very low level for competitors ($\beta = 0.42$; $p$-value = 0.013). By contrast, coopetitors reveal a nonsignificant level of CKV during the first month, but their CKV level becomes significant in the third month ($\beta = 0.781$; $p$-value = 0.001). Coopetitors' willingness to share their knowledge depends on the quality of the social bonds that they develop with others. Therefore, they need time to create a friendly environment before they submit ideas. Cooperators tend to rapidly engage themselves in the community and to evaluate others' submissions rather than submitting ideas. Competitors' willingness to post ideas strongly depends on the initial feedback they receive from the community. Indeed, one of the interviewed competitors explained why he no longer wanted to post ideas:

> When I posted my first ideas I found it cool to submit my project. Then, I received comments that were not really pleasant. So I was a bit disappointed. I paid €30 to have the opportunity to submit my project, and I received only negative feedback and unpleasant comments. Therefore, I do not really want to post new ideas and go on the platform. (Interview #1)

Table 4 reveals that, from the first to the third month, the cooperators present significantly higher CIV than any other profiles ($\beta 1 = 2.657$; $\beta 2 = 1.311$; $\beta 3 = 1.054$). Indeed, once integrated into the community, cooperators rapidly consider the need for them to influence the co-creation process occurring on the platform by promoting or not submitting projects. Regarding the competitors, whereas they do not directly try to influence the selection process, they sometimes demonstrate opportunistic behaviors such as creating fake accounts or involving friends and relatives on the platform to promote their ideas or sabotage others' projects. Cooperators and coopetitors severely condemn these behaviors. For example,

> I have noticed something and I would like to have your opinion. I think that some users on the website have two accounts, one to submit their ideas and another one to vote for whatever they want. But, that's only my opinion because, like you, I still have not retrieved my 10 votes. (Comment #741)

> If you have removed some votes, please put them back. You have to know that it's not useful to scuttle others' ideas. First, it biases the results. Then, it does not help the platform's experts. Finally, it gets on members' nerves who receive negative votes without any explanations. (Comment #317)

Finally, as displayed in Table 4, the coopetitors exhibit a higher level of CRV during the three months ($\beta 1 = 3.661$; $\beta 2 = 1.311$; and $\beta 3 = 1.054$). Because the coopetitors highly value the interactions regarding their projects, their participation depends on the presence of feedback on their submitted ideas. This is illustrated, for example, by a user's comment blaming the community for not receiving any positive or negative feedback on his project:

> Some ideas do not receive any comments or feedback for one month. Is this your definition of a community? I think that people here seek feedback, criticism and direction to position and develop their ideas. (Comment #2100)

The analysis of the relationships between the CEV components highlights that the CRV score is positively related to the CIV and CKV scores across the three months. This finding indicates the importance of CRV on the co-creation platform and the key role played by coopetitors on the platform, as they display the greatest level of CRV across the three months. Indeed, by interacting with others, coopetitors increasingly engage with the community, thereby enabling them to attract contributors to their projects and, consequently, inspiring them to submit more ideas. Furthermore, to enhance their relationships with other users, coopetitors show their support for them by voting for their projects. However, as the voting system is anonymous on the co-creation platform, coopetitors post comments such as "I am voting for your project" or "+ 1 vote" to publicly show their support when they vote.

### *Emotional Engagement Outcomes*

Regarding emotional engagement, cooperators and coopetitors reveal anger and irritation toward competition mechanics when they are misused by competitors. They consider these practices harmful for the community's objective because they promote opportunistic behaviors and bias the ideas selection process. The following extract regarding a form of competition mechanics, the vote system operated on the platform, illustrates this statement:

> It is useless to sabotage other projects. On the one hand, it biases the competition for the idea selections. On the other hand, it tends to get on members' nerves who suffer from negative votes and feedback without valuable comments. (Comment #351)

Positive and negative feedback also influence the emotional engagement experienced by users. Although users feel excitement and happiness when they

succeed, coopetitors and competitors react differently when they receive negative feedback and results. Indeed, competitors receiving negative feedback express doubt about the platform's functioning and the users' competences and understanding. The reaction of a competitor whose ideas have been rejected illustrates this statement:

> My worst memory of my participation on the platform is the unpleasant comments I received regarding the ideas I had submitted. That disappointed and demotivated me to submit again. It is quite surprising because I bought the opportunity to submit ideas. I paid €30 and then I received this unpleasant feedback. Therefore, I do not want to submit anything anymore. (Interview #1)

By contrast, coopetitors consider negative feedback as a source of learning; consequently, they want to submit more projects, but they refine their practices. For example, here is the reaction of a user whose ideas have been rejected by the community because the product was already available and thus not innovative:

> I'm really happy that it exists. I have mine (easy and cheaper!). I have used it every day for years and it works. I will come back with another idea! I "invent" or rather "put together" firstly for fun and the sake of enjoyment. I'm really happy to have found this community. So I will try further. (Comment #1850)

However, coopetitors exhibit disappointment when they are negatively judged by peers without receiving comments or appropriate feedback. Indeed, they consider the judgment to be either from people who do not have the skills to evaluate their work because they are not able to contribute or from competitors who tend to sabotage others' projects for their own benefit in the competition. The following comment illustrates coopetitors' disappointment in receiving negative votes without feedback:

> I would like to thank the contributors giving their impression about my idea. They can be pro or against. Since I am registered on this platform my objective is to share with the community. However, a vote "against" without any justification is really disappointing as it does not provide the opportunity to generate a debate and thus to improve the project. That is what makes people grow up. (Comment #51)

### *Cognitive Engagement Outcomes*

Coopetitors and cooperators frequently reveal the emulation they feel, sometimes uncontrolled, when they interact on the co-creation platform not only for their own but also for others' projects. This emulation leads them to further contribute to the submitted projects by bringing ideas, associating projects, or creating additional and advanced methods of presenting the

project (e.g., videos and design schematics). The following comment reflects idea emulation occurring:

> That's me again! When ideas jostle in my mind, I can't stop it. (Comment #6)

Cooperators value the development of the co-creation platform and the related community. Therefore, the quality of the submitted ideas is considered a key element for the proper development of the platform. To ensure the quality of the process, cooperators not only contribute to others' projects but also assess the submitted ideas and influence the selection process. This willingness to assess the relevance of the submitted projects leads them sometimes to conduct further investigations. This practice is often strongly rejected by competitors, who feel their legitimacy is doubted, as depicted by the following dialogue between a cooperator and a competitor just after the former demonstrates that the submitted ideas already exist in multiple forms:

> Competitor: Sorry, but I really do not understand your approach. If you have time to lose with investigations, go ahead, but honestly I do not see your point. (Comment #1515)

> Cooperator: As I am used to doing when people do not know me, I will justify my approach! If there would not be any interest in looking if similar products or patents already exist, why do the platform managers ask that such research be performed BEFORE posting ideas? Indeed, it is not sufficient to have a great idea, you also need to be able to assess the innovative characteristic, the potential market size and the existing competition. (Comment #1516)

## Discussion

This study investigates gamification mechanics as a means of creating, boosting, and maintaining users' engagement with a co-creation platform. Using multiple complementary methodologies, namely, cluster analysis, netnography, and multiple regression analysis, these exploratory research findings provide strong evidence to support the existence of four user profiles interacting on the co-creation platform. These profiles reveal particular motives, behaviors, and reactions toward gamification mechanics. This study assesses users' level of behavioral, emotional, and cognitive engagement and captures the dynamic nature of this engagement by adopting a longitudinal perspective.

The four emerging profiles that we identified are supported by agency and communion theory used to characterize individuals' interpersonal interactions [3]. Individuals who exhibit an agent orientation tend to emphasize their mastery and dominance of their environment, whereas communion-oriented people interact to ensure the harmony and development of their environment [63, 88]. Therefore, whereas the previous literature distinguishes cooperation and competition as two extremes of one dimension, the communion and agency literature

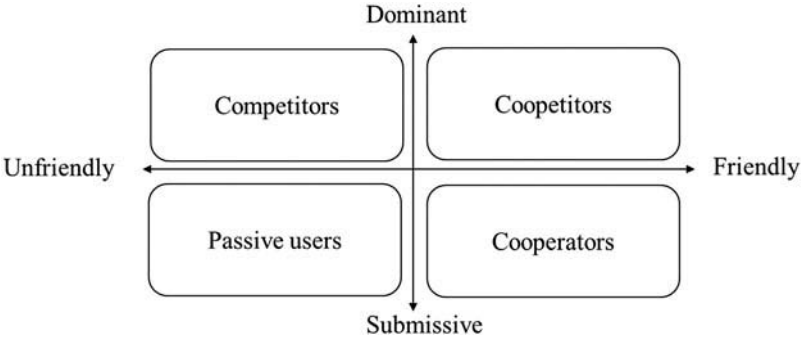


**Figure 7. Classification of Emerging Clusters Through Agency (Dominant–Submissive) and Communion (Unfriendly–Friendly) Dimensions**

considers them as distinct dimensions. Given the dimensions depicted in Figure 7, we classified competitors as dominant and unfriendly (A+/C–). These users tend to dominate the platform by submitting well-designed ideas and succeeding in commercializing their projects. Cooperators emphasize submissive and friendly behaviors (A–/C+). They aim to sustain and develop the platform. They serve the community. Coopetitors exhibit leadership on the platform as they interact well with other users to develop their own projects (A+/C+). Finally, invisible users do not take part in the community or perform actions on the platform (A–/C–). They are spectators [82]. The community/agency classification reveals that users' profiles are distinguished according to the object of their engagement and, consequently, the ways that they use their resources to contribute to the value co-creation process. Indeed, whereas competitors are engaged in co-creation activities, cooperators are engaged in the community that has developed around the co-creation process. Coopetitors split their resources between both objects.

Based on these insights regarding users' profiles, we examined their behavioral, cognitive, and emotional engagement to propose a conceptual model for a gamified co-creation platform. As depicted in Figure 8, according to their profiles, users seem to make different contributions on the co-creation platform and specific expectations regarding the value they want to obtain from their interactions [42, 65, 70]. The motives emerging from the content analysis are consistent with previous research investigating users' activities on online co-creation platforms [29, 68, 69, 70, 81, 101]. However, this study reveals the salience of specific motives according to the users' profiles. Indeed, competitors seem to be highly concerned by the efficiency aspect and mainly seek to commercialize their already well-designed ideas; they are driven by extrinsic motives [81]. Cooperators seem to be highly involved in the community. They are mainly motivated by being integrated within a community and being recognized as part of it [70, 81]. The invisible users are driven by their curiosity, and they most value the hedonic dimension of their experience on the platform because they seem to enjoy exploring and discovering others' projects and debates [70]. Regarding coopetitors, they are described in the previous literature as a hybrid profile between cooperators and competitors [16]. However, the content analysis reveals that coopetitors have specific motives as they seek

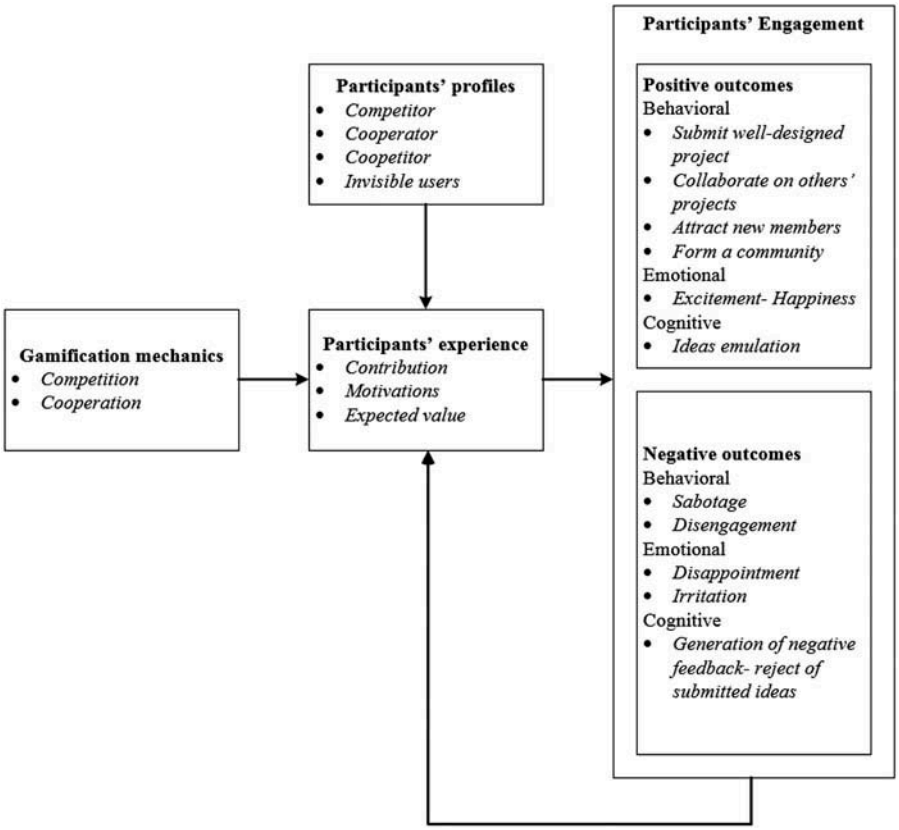


**Figure 8. Theoretical Framework**

collaboration on their own projects by interacting with other users [81]. In that context, the gamification mechanics are used by users to derive their expected value. Competition mechanics are used by competitors and coopetitors to legitimize their expertise. Cooperation mechanics are used by coopetitors to motivate others to contribute to their own projects. Other user profiles are indifferent to these mechanics, especially the cooperators, who reject them, because they would risk distracting users from the primary platform objective, that is, the joint development of innovations.

In line with Robson et al. [83], who adopted the MDE framework, this study demonstrates that based on the gamified co-creation experience, users' engagement outcomes can be either emotional or behavioral. Additionally, we emphasize the cognitive engagement outcomes that may be generated through such experiences. In the new product development process, these cognitive manifestations of engagement take, for example, the form of idea emulation or rich user reviews of submitted ideas. These three forms of user engagement outcomes—cognitive, emotional, and behavioral—are supported by Brodie et al. [13]. According to the content analysis, CE may generate positive or negative effects on the general functioning of a co-creation platform [96]. Indeed, because the

multiple profiles have different motives and contributions, their interactions reveal potential conflicting interests [5]. For example, competitors, who are characterized by short-term participation, are often criticized and do not receive sufficient legitimacy from cooperators and coopetitors, who value long-term participation. Therefore, competitors tend to disengage from the co-creation platform after some time as they see the interest in their ideas and projects decreasing. The lack of interest in competitors' projects comes from the cooperators' and coopetitors' underestimation of competitors' contributions because they consider competitors to be newcomers. This type of conflict is due to distinct objects of engagement considered by users' profiles. Being exclusively engaged to only one focal object, whether the activity or the community, may lead users to adopt defective behaviors [34]. Whereas cooperators overperform their role as judge on the platform, competitors tend to cheat to be rewarded. Engaging in these defective behaviors induces value co-destruction within the co-creation platform. In contrast to value co-creation, value co-destruction refers to practices that lead to the decline of value for at least one actor through inappropriate or unexpected uses of resources [75, 76]. These value co-destructions issues are sources of conflicts between the different users' profiles. Therefore, coopetitors seem to be the most valuable partner as they share their engagement between the activity and the community.

Finally, as suggested by Brodie et al. [13], this study captures the iterative and dynamic nature of engagement. Indeed, for the different user profiles, the CE evolves differently. Whereas competitors exhibit short-term engagement, cooperators and coopetitors are long-term partners. We also show the key role played by coopetitors on the platform; they expand their contribution over time by providing knowledge, influencing the process, and interacting with other users. They are the user segment to target in order to maximize CEV. This insight lends nuance to the findings of Bullinger et al. [16], emphasizing the limited interest in attracting coopetitors on the co-creation platform. We underline that coopetitors greatly influence the co-creation process but need time to create social bonds with others and to share their knowledge on the platform.

## Conclusions

In increasingly complex competitive environments, the opportunity to engage customers in a value co-creation process is a highly challenging task for companies, especially in the online context. This study, which is based on complementary qualitative and quantitative methods, offers a fine-grained understanding of how gamification mechanics might be used to create, boost, and maintain users' engagement toward a co-creation platform. Therefore, this study, which is supported by the communion and agency literature, highlighted four user profiles—cooperators, competitors, coopetitors, and invisible users. We then assessed the multiple levels and intensity of emotional, cognitive, and behavioral engagement according to the user profiles and captured the dynamic and iterative nature of CE through a longitudinal perspective. Finally, a theoretical model summarizing our findings was proposed to stimulate further empirical studies.

This study bridges marketing and game studies and contributes to both fields. We emphasize gamification as a valuable means of designing smart technologies (e.g., wearable devices, 3D environment, social media, connected technologies, and Kinect technologies) to create, boost, and maintain users' engagement, a widely targeted variable for marketing managers (Breidbach, Kolb, and Srinivasan [12], Djelassi and Decoopman [23], Ostrom et al. [73], Pagani and Mirabello [74]). This study highlights four profiles of users who react differently to gamification mechanics and provides insights into how these users coexist and interact through a smart platform (Angelis, Parry, and Macintyre [2]; Navarro, Garzón, and Roig-Tierno [71]; Vernette and Hamdi-Kidar [92]). Furthermore, we captured the dynamics and iterative nature of CE, as described in a recent study by Brodie et al. [13], by highlighting the evolution of CE according to the various user profiles. Regarding behavioral engagement, we extend the work of Dejean and Jullien [19] by indicating that the biggest contributors will have similar behaviors over time. Whereas these authors limited their investigations to contributions related to knowledge sharing, we include other types of inputs that influence the process, such as votes or comments that recommend some type of action, and highlight the evolution that may occur according to user profiles, especially for the coopetitor profile. We also add nuance to the findings of Bullinger et al. [16], showing cooperators' inefficacy in innovativeness, and highlight these coopetitors' abilities to unite around a joint project. Finally, this study contributes to the game literature by noting the cognitive dimension of CE in addition to the emotional and behavioral dimensions, which have already been emphasized by the MDE framework [47, 83]. The cognitive dimension emerges from the content analysis and is supported by the literature related to CE [13, 14].

Despite our intensive and multimethod approach, some limitations persist. Because this study is one of the first explorations of gamification mechanics [39, 64], further research should provide generalizability to our findings and investigate other gamification practices, such as badge systems, 3D environments, or playful design, and other contexts, such as health care, retail, or services. The use of an experiential approach and the associated metrics [30, 65] seem to be a valuable alternative. Furthermore, this study and the MDE framework highlight the role of emotions on the gamified co-creation platform, but we need to further assess how the users' emotions potentially predict their current and future engagement or disengagement. Therefore, valid scales, such as the pleasure–arousal–dominance (PAD) framework [66], or textual analysis might be fruitful alternatives. However, these suggestions for future investigations require the adoption of a longitudinal approach to capture the evolution of users' engagement over time. This study provides practitioners with guidelines regarding the relevance of using competition and cooperation mechanics according to the profiles they want to interact with. For example, our study does not support using competition or cooperation mechanics in an online community because these practices are rejected by cooperators, who constitute a large fraction of the members on these platforms. Competition mechanics are more relevant when managers expect an intense but punctual contribution. A combination of cooperation and competition mechanics would be valuable when managers plan to collaborate with coopetitors in a long-term partnership.

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THOMAS LECLERCQ (t.leclercq@uclouvain-mons.be; corresponding author) is a Ph.D. candidate in the Department of Marketing at Catholic University of Louvain, Belgium, and a member of the Center of Excellence on Consumers and Marketing Strategy. His research interests are in the fields of service and product innovation,

and digital marketing. His work has been published in *Recherche et Applications en Marketing* and *Technological Forecasting and Social Change*. He has won several awards for his research papers.

INGRID PONCIN (ingrid.poncin@uclouvain-mons.be) is a professor of marketing at Catholic University of Louvain, Belgium, and a member of the Center of Excellence on Consumers and Marketing Strategy. She is in charge of the IPM Digital Marketing Chair. She completed her Ph.D. in marketing at Facultés Universitaires Catholiques de Mons, Belgium, for which she received the Gouverneur Cornez Award. Her research interests concern use and measurement of affect in marketing, attachment toward brand and company, digital marketing, gamification, multichannel consumer behavior, avatars, adoption of new technologies, and consumer behavior in the digital world. Her work has been published in *Recherche et Applications en Marketing, Revue Française du Marketing, Journal of Advertising, Journal of Retailing and Consumer Services Information and Management*, and others. She has regularly published in the proceedings of international and national academic conferences, such as Advances in Consumer Research, European Marketing Academy, Association Française de Marketing, and Academy of Marketing Science.

WAFA HAMMEDI (wafa.hammedi@unamur.be) is an associate professor of service innovation and marketing at the University of Namur, Belgium. She is also an academic scholar at Cornell University. She received her Ph.D. from the Institute for Management Research of the Radboud University Nijmegen, the Netherlands. Her primary research interests are service innovation and marketing. Her work focuses on virtual communities, customer engagement, and customer co-creation experiences. Her work has been published in *Journal of Product Innovation Management, Industrial Marketing Management, Journal of Service Management, Decision Management, Journal of Business Research*, and others, and she has several book chapters to her credit. She has won several awards for her research papers. She is also the cofounder and cochair of the international conference Let's Talk about Service, sponsored by SERVSIG of the American Marketing Association.