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# What Facilitates and Constrains Value Co-Creation in Online Communities: a Sociomateriality Perspective

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## *Abstract*

We investigated factors that facilitate and constrain value co-creation in organization-sponsored online communities. We drew on sociomateriality and analyzed 28,000 online posts and 26 interviews from two Indonesian online communities. Results revealed new facilitators and constraints, including transparency, participatory leadership, content quality, social hierarchy, sense of community, flexibility, and privacy. All facilitators and constraints were associated with four actors: individual participants, organization, technology, and sociality. Findings showed that any factor could act as a constraint or a facilitator depending on the community, individual perceptions, and other circumstances, and that a dynamic tension exists between facilitators and constraints in online communities.

Keywords: Organization-sponsored online community, Sociomateriality, Value co-creation

# 1. Introduction

Businesses are increasingly using digital technologies, such as online communities, to co-create products and services (Nation 2019). Online communities have gained a reputation for their ability to involve customers in an organization's value co-creation processes (Abedin & Qahri-Saremi 2018). A well-managed co-creation process can lead to new business opportunities, cost reduction, rich interactions between the organization and its customers, and an expanded customer base (Park et al. 2019; Ind et al. 2013). Examples of thriving organization-sponsored online communities can be found in various sectors, such as the Aston Martin Community in the automotive industry (Essamri et al. 2019), the Huafen club for Huawei mobile phone users (Zhao et al. 2019), SAP in the computer industry (Tavakoli et al. 2017), and Starbucks in the hospitality industry (Wong et al. 2016). These developments have motivated research into value co-creation in organization-sponsored online communities and its underlying facilitators or constraints (Frasquet-Deltoro et al. 2019).

Studies to date have generated conflicting findings about what can constrain or facilitate value co-creation in online communities and the interrelationships between facilitators and constraints. For example, awareness of other members' activities and sense of community are known to be important facilitators of participation in online communities (Abedin et al., 2011; Gibbs et al. 2019; Kim et al. 2008), but they can constrain participation when members compete with one another to win awards (Hall & Graham 2004) or in circumstances where a high level of exchanges overloads members (Lee et al., 2018; Zhang, Wang, Chen, & Guo, 2019). Previous research has been important in helping us manage online communities and improve the outcomes of the value co-creation process, but much of it has overlooked the dynamic interrelationship between facilitating and constraining factors of value co-creation in online communities (Briel & Recker 2017).

Some scholars attribute the interrelationship between facilitating and constraining factors to the fluidity of online communities (Bailey et al. 2019). This fluidity reflects the dynamic configuration of their organizational structures (Faraj et al. 2011), which means that the community rules, participants, and interactions are dynamic, and may change continually. Although a sponsored online community is created and managed by an organization, the organization lacks authority to issue commands, meaning individual participants are not obligated to comply or obey. Therefore, the organization lacks control over value creation. The fluidity of online communities is unavoidable and should be regarded as a unique characteristic that can bring advantages such as effective knowledge flow if managed appropriately (Faraj et al. 2016). It may also explain why some facilitators in some online communities are constraints in others and vice versa.

Other scholars have argued that facilitating and constraining factors for online communities are interrelated due to the connection between the technology, the organization, and community participants as the actors involved in the value co-creation process (Park et al. 2019; Abedin & Babar 2018). They stress the importance of considering actors' roles, as well as the interactions between them (Ind & Coates, 2013; Park et al. 2019; Gebauer et al. 2013; von Briel & Recker 2017). Thus, sociomateriality, which considers all actors in value co-creation and emphasizes the interpretation of the technology as it is used by other actors (Kecmanovic et al. 2014; Brodie et al. 2013), offers an appropriate theoretical lens for this topic. Sociomateriality holds that "the world is constituted by or comprised of ontologically distinct entities (social and technical) that interact or connect in order to produce organizational phenomena" (Hultin, 2019 page 91). This perspective assumes that all social actions are possible because of the

technology and vice versa (Leonardi 2012) and highlights the importance of the technology as well as human actors in shaping value co-creation processes.

Scholars such as Nambisan et al. (2017) and Faraj et al. (2015) have called for more in-depth and cross-community studies that examine dynamic relationships in online communities and generate a more coherent picture of facilitating and constraining factors. In this paper, we responded to this call and contribute to the literature on value co-creation in online communities by answering two questions: (i) what factors facilitate and constrain value co-creation in organization-sponsored online communities as fluid settings? And (ii) what is the interrelationship between these factors? We drew on sociomateriality, as the theoretical lens, and used multiple case study methodology to address these questions. Through an empirical cross-community investigation, we demonstrated the interaction between all actors involved in the value co-creation process. We explored the dynamic relationship between facilitating and constraining factors and revealed that this relationship can be tenuous and dependent on the community, individual perceptions, and/or other circumstances. Our findings can assist organizations which sponsor online communities to develop improved management strategies, which should lead to more active participation and higher value creation for all contributors.

We focused on communities of interest, defined as online communities that consist of people who share a common interest or passion, such as a brand or health issue, and are not bound by geography (Brodie et al. 2013; Laroche et al. 2012; Misra et al. 2008; Ståhlbröst & Bergvall-Kåreborn 2011). We examined two similar online communities sponsored by Indonesian fashion industry organizations. Both organizations are among the top five online sellers of handmade leather bags in Indonesia. They sponsor online communities to sell their products, engage with customers in the design of new bags, and allow customers to interact with each other (e.g. reselling their bags, sometimes for more than the original sale price). We built on our earlier systematic review of literature on online communities (Priharsari et al., 2020; Priharsari et al., 2019), and triangulate our previous findings with the results of analysis of data from 26 interviews with customers and an examination of 28,000 posts from customers from two active Indonesian online communities.

The next section provides an overview of the literature, the theoretical underpinnings of the study, and a summary of an earlier systematic literature review (SLR) on value co-creation in sponsored online communities. Then, we outline the design of the research and present the context under study. We introduce our two case studies (i.e. online communities) and their products, and how interviews and content analysis of online discussions were used to examine value co-creation in the two cases. We discuss our findings about new facilitating and constraining factors and present the tension and dynamic relationship between them. We conclude the paper with a discussion of implications for sociomateriality and practice and propose directions for future research.

## 2. Literature Review

### Value Co-Creation

Value co-creation usually describes a participative process between customers and a sponsoring organization that generates value (Ind & Coates 2013). Co-creation refers to strategies that organizations use to engage with their customers (Piller et al. 2011; Prahalad & Ramaswamy 2002) and to develop an understanding of them and their needs (Piller et al. 2011). Co-creation implies the willingness of the organization to engage collaboratively with customers for mutual benefit (Ind et al., 2013). Co-creation

ought to be viewed as a process that enables ongoing interaction, in which all actors integrate their resources and engage in service exchange to make value; it is not limited to product development (Nambisan & Baron 2007) and contributes to customer wellbeing, even without their awareness (Vargo & Lusch 2004; 2016). Because interactions between the organization and its customers are increasingly becoming the main site of value co-creation (Prahalad & Ramaswamy 2004), it is important to understand how all actors engage in value co-creation so that an organization can manage the process effectively (Payne et al. 2008).

### A Sponsored Online Community as a Fluid Organization

As Figure 1 shows, fluidity – the dynamic configuration of organizational structures – is one of the fundamental characteristics of online communities (Bailey et al. 2019; Faraj et al. 2011; Nielsen 2018). In online communities, rules, participants, and interactions constantly change over time. Fluidity may also relate to the formation of the organization of an online community (Pica & Kakiyama 2003). Internet technology makes it possible for traditional organizations to become more fluid, allowing participants to be connected beyond location and time boundaries. It also makes the boundaries and memberships of online communities hard to identify. Many individuals in online communities are at various stages of exit and entry that change over time. Participation ranges from being highly and continuously committed to partaking at various levels at discrete points in time. Fluidity in an organization is enabled by the stability of interactions afforded by the technology (Pica & Kakiyama 2003).

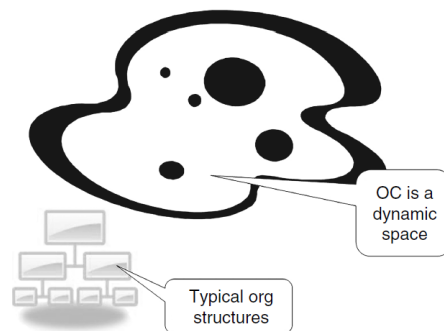


Figure 1. An online community (OC) as a fluid object (Faraj et al. 2011)

The fluid nature of online communities has significant implications for the distribution of resources that go beyond the study of organizational form. Fluidity requires us to look at the dynamics rather than the simple presence of the structural form of resources. Resources may flow inside and outside the online community, with positive and negative consequences (Faraj et al. 2011). These fluctuations in resources can create variations in tensions, creating challenges to organizations in areas, such as maintaining boundaries, identity building, and routine adoptions (Schreyögg & Sydow 2010). The source of these fluctuations is the actors involved in the online community. Thus, we contend that a deeper understanding of the actors that interact in a dynamic organization, as well as a better understanding of the attributes of actors that contribute to value co-creation, will contribute substantially to research into collaboration involving organizations in general.

### Human and Technology Agency from a Sociomateriality Perspective

The sociomateriality approach distinguishes information systems research from technological determinism. It provides a way to make sense of a world in which continuously changing technology is

inseparable from continually changing social practices (Utesheva & Boell 2016). Sociomateriality symbolizes technical and social interests, and particularly their intertwining, that develop routinized behaviors (Cecez-Kecmanovic et al. 2014; Leonardi 2013). Sociomateriality combines the arrangement of technology (materiality) with abstract social concepts such as norms, policies, and communication patterns (Leonardi 2013). From a sociomateriality point of view, an online co-creation community is the result of the intertwining of human relations and technology in the constitution of a community (Cecez-Kecmanovic et al. 2014; Leonardi 2013).

Online co-creation communities are one example of how technical and social elements can be interwoven into one identity (Faraj et al. 2016). As Faraj et al. (2016) explained, a good technical platform is important for creating a vibrant online community, but participants' active behavior and social interactions are necessary conditions to develop and make sense of the community. Sociomateriality can explain dynamic interactions in the digital world (Nambisan et al., 2017) through the incorporation of the role of technology as well as institutional and individual human actors (Kecmanovic et al. 2014; Brodie et al. 2013). Limiting our view to any one actor ignores the impact of other actors (Storbacka et al. 2016). For instance, technology itself can be seen as a material with features used by individuals; however, the interpretation of technology emerges as a result of its interactions with humans (Leonardi 2011).

Value co-creation occurs through service exchange between all actors (Vargo and Lusch 2016). As such, the enactment of activities that meld technology with community users as well as the organization evolves sociality, which reflects the tendency to associate in or form social entities or groups (Merriam-Webster, 2020). We, therefore, view interactions in value co-creation as created by four actors, where sociality results from the interaction between the other three actors, as depicted in Figure 2.

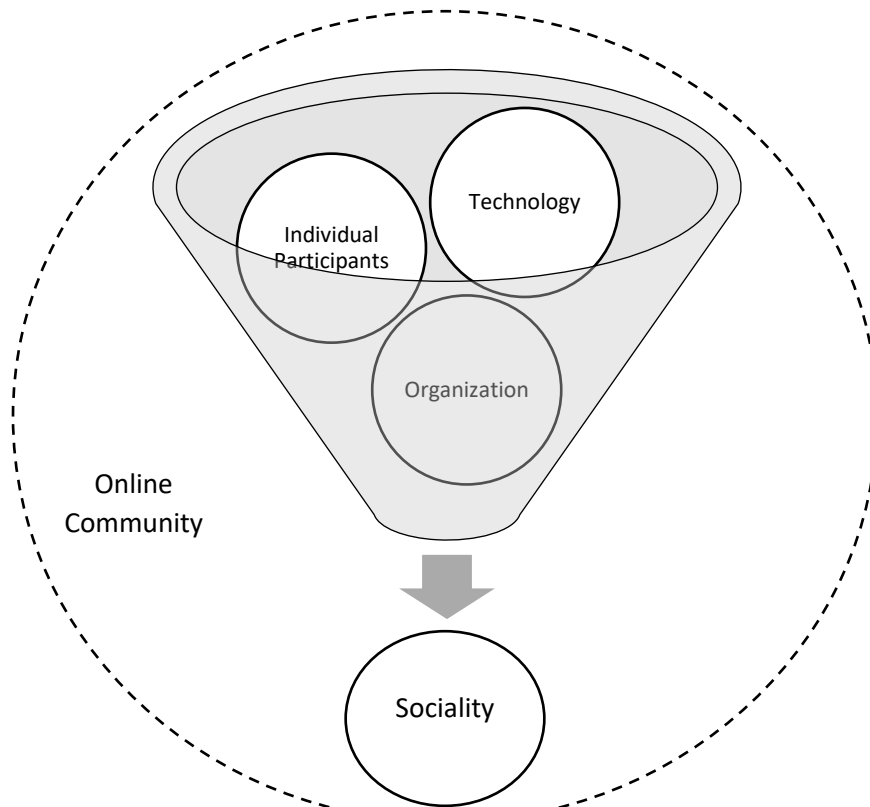


Figure 2. Actors in online communities

## Previous Findings on Value Co-creation Facilitators and Constraints

Understanding the facilitators of and constraints on value co-creation will assist sponsoring organizations to develop better strategies for managing online communities, which in turn can be expected to lead to more active participation and greater value generation for all contributors. We previously conducted a SLR on what enables or inhibits value co-creation in online communities and identified facilitating and constraining factors in association with the four actors listed above (Priharsari et al., 2020).

Table 1 summarizes our SLR findings; it lists factors and the underlying categories previously reported as facilitating or constraining value co-creation in online communities (more detail can be found in Appendix I). In the next section, we outline how we extended and built on the information summarized in Table 1 by interviewing participants in two online communities and analyzing community members' textual discussions.

Table 1. Value co-creation facilitators and constraints in online communities

Factor	Description	Categories	Sources
<b>Organization</b>			
Participatory leadership	Listens and responds to the community by proactively leveraging the power of the virtual community to mutually benefit customers; e.g. the involvement of participants in decision-making gives them the freedom to share their opinion	<ul style="list-style-type: none"> <li>• Formal and Informal Communication</li> <li>• Participation in Decision-Making</li> <li>• Creative Customer Identification</li> <li>• Activity Development</li> </ul>	Chen et al. (2012); Gebauer et al. (2013); Hasan & Rahman (2017); Kohler et al. (2011); Nambisan & Nambisan (2008)
Reward systems	The incentives, financial or non-financial, that the provider gives to encourage customers' participation in value co-creation	<ul style="list-style-type: none"> <li>• Monetary reward system</li> <li>• Reputation Mechanism</li> </ul>	Füller (2006); Hall & Graham (2004); Hasan & Rahman (2017); Jeppesen & Frederiksen (2006); Nambisan & Nambisan (2008); Zhang, Kandampully & Bilgihan (2015)
Transparency	Clarity and transparency related to the process, role, and outcomes	<ul style="list-style-type: none"> <li>• Customer Role Transparency</li> <li>• Process Transparency</li> <li>• Outcome Transparency</li> </ul>	Hasan & Rahman (2017); Nambisan & Nambisan (2008)
<b>Individual</b>			
Motivation	The benefits that the individual receives	<ul style="list-style-type: none"> <li>• Benefits</li> <li>• Expectation</li> <li>• Commitment</li> </ul>	Brodie et al. (2013); Bugshan (2015); Constantinides et al. (2015); Erfani et al. (2013); Fernandes & Remelhe (2016); Füller (2006, 2010); M. Kang (2014); Nambisan & Baron (2007); Roberts et al. (2014); Schaedel & Clement (2010)
Personal attributes	The qualities or characteristics of individual participants, such as interests, knowledge, and skills	<ul style="list-style-type: none"> <li>• Current Skills and Knowledge</li> <li>• Personality Type</li> <li>• Personal Value</li> </ul>	Füller (2010); Hasan & Rahman (2017); Jeppesen & Frederiksen (2006); Mai & Olsen (2015); Ståhlbröst & Bergvall-Kåreborn (2011)
Personal evaluation of community	Participants' evaluation of interaction experience, including affective evaluation and assessment of what is gained and what is given up	<ul style="list-style-type: none"> <li>• Affective Evaluation</li> <li>• Experience</li> <li>• Value Equity</li> </ul>	(Blasco-Arcas et al. (2014); Erfani et al. (2013); Füller (2010); M. Kang (2014); Nambisan & Baron (2007)
<b>Technology</b>			
Association	The ability to establish connections between individuals and between individuals and content	<ul style="list-style-type: none"> <li>• Interpersonal Relationships</li> <li>• Associations between Individual and Content</li> </ul>	Blasco-Arcas et al. (2014); Hasan & Rahman (2017)
Interactivity	The ability to enable members to come together in various ways, such as collective or asynchronous contributions	<ul style="list-style-type: none"> <li>• Social Translucence</li> <li>• Interactive Feature</li> <li>• Virtual Reality</li> </ul>	Füller et al. (2009); Hasan & Rahman (2017); Kohler et al. (2011); Misra et al. (2008);



Factor	Description	Categories	Sources
			Nambisan & Nambisan (2008); Seraj (2012)
Persistence	The ability to provide information in consistent form	<ul style="list-style-type: none"> <li>• Accessibility</li> <li>• Consistent Presentation</li> </ul>	Booth & Kellogg (2015); Hasan & Rahman (2017)
Visibility	The ability to locate information related to knowledge, behavior, preferences, and communication network	<ul style="list-style-type: none"> <li>• Rating System</li> <li>• Information Centre</li> <li>• Usability</li> <li>• Searching Tool</li> </ul>	Booth & Kellogg (2015); Cheung & To 2016; Hasan & Rahman (2017); Kohler et al. (2011); M. Kang (2014); Nambisan & Nambisan (2008); Zhang, Lu, et al. (2015)
<b>Sociality</b>			
Equality	The norm of reciprocity and perception of fairness	<ul style="list-style-type: none"> <li>• Norm of Reciprocity</li> <li>• Perceived of Fairness</li> </ul>	Gebauer et al. (2013); Wiertz & de Ruyter (2007)
Content quality	Usefulness and balance between personal opinion and credible information	<ul style="list-style-type: none"> <li>• The Usefulness of Content Discussion</li> <li>• Balance Between Personal and Facts</li> </ul>	Laing et al. (2011); Seraj (2012)
Sense of community	A feeling of belonging which is marked by a shared consciousness, shared rituals and traditions, and a sense of moral responsibility	<ul style="list-style-type: none"> <li>• Social Bond</li> <li>• Community Identity</li> <li>• Obligation to the Community</li> </ul>	Brodie et al. (2013); Bugshan (2015); Chen et al. (2012); Gebauer et al. (2013); Hall & Graham (2004); Healy & McDonagh (2013); Laroche et al. (2012); Nambisan & Baron (2007); Pongsakornrungsilp & Schroeder (2011); Wiertz & de Ruyter (2007); Zhang, Kandampully, et al. (2015); Zhao et al. (2015)
Similarity	Common connections, interests, and hobbies	<ul style="list-style-type: none"> <li>• Shared Interest</li> <li>• Members' Commonality</li> </ul>	Brodie et al. (2013); Misra et al. (2008); Zhao et al. (2015)
Trust	The safe feeling within an environment built from policies and cultural norms that enables participants to express ideas and to experiment with new ways of approaching problems	<ul style="list-style-type: none"> <li>• Integrity Trust</li> <li>• Benevolence Trust</li> </ul>	Laing et al. (2011); Seraj (2012); Zhao et al. (2015)

### 3. Research Design

We employed a multiple case study design to study two organization-sponsored online communities, which we call Cases 1 and 2 (associated with Organizations 1 and 2). All members of both cases were women. Organizations 1 and 2 are among five small–medium market frontrunners in the production of leather bags in Indonesia (Dian 2018).

## Case Details

These two online communities were selected based on five criteria proposed by Kozinets (2010), as per Table 2. The first criterion is “relevance”, which ensures the selected case is relevant to the research questions. The second criterion is “active”, which makes sure members of the selected online community actively engage in online discussions throughout the study. Next, the online community should be “interactive”, which means the community demonstrates continuous communication between members. This can be assured through the existence of a large number of different threads, a high flow of communication between members, and an energetic feeling in the community. Another criterion is “data-rich”, which represents that the available data can enable researchers with a deep and rich analysis of interactions in the community. Lastly, the online community should be “heterogeneous”, meaning there is substantial diversity among community members and the dynamic interactions between them.

Table 2. Case studies (Cases 1 and 2)

Criteria	Definition	Case 1	Case 2
<b>Relevant</b>	Relevant to the research questions	A vibrant community of interest, explicitly sponsored by the organization	
<b>Active</b>	High post traffic	Yes	
<b>Interactive</b>	Large numbers of discrete threads	More than 20 threads per day	At least, 10 threads per day
	A high flow of communication	A high rate of responses from other members in each thread. A post in one thread may receive a more than 100 replies.	
	Energetic feel	Passionate participation in the community	
<b>Data-rich</b>	Descriptively rich data	Various activities in the community	
<b>Heterogeneous</b>	Various participants	20,000 members Mostly Indonesian women, and also women from Middle Eastern and other Southeast Asian countries	8,000 members Mostly Indonesian women, and also women from Middle Eastern and other Southeast Asian countries

Organizations 1 and 2 are comparable in size, products, and market share. As noted earlier, both are among the top five sellers of handmade leather bags in Indonesia. They sponsor online communities to sell their products, engage with customers in the design of new bags, and allow customers to interact with each other (e.g. to resell their bags and share their experience of using the bags). Their products include handbags, wallets, pouches, and backpacks. The organizations are very well known in Indonesia because they offer high-quality leather bags at affordable prices (typically US\$40–\$60). Cases 1 and 2 communities are well known to Indonesian leather bag collectors because they are among the biggest of their kind in Indonesia and have members worldwide. Membership of these online communities is a privilege, and the approval process can take months. The long duration of the acceptance process does not discourage aspiring members from applying; instead, it gives them a greater sense of pride when they become part of the community.

Organization 1 was established in 2009. It has no physical outlets and does not sell its products via its website or other online retailers. Organization 1's products are sold only through a Facebook-based online community (which we call "Organization 1 Fans") that is sponsored, developed, and nurtured by the organization. This private online community has more than 20,000 members and was created in early 2015. The process of acquiring Organization 1's bags is challenging and simultaneously attractive to customers. Small runs of some models of bags are released for sale to the online community once a week, in a process which is transparent and closely monitored by other members; they use shared files and other Facebook features to make sure the rules are obeyed. This community is well known for the close relationships that exist between members, which its slogan "from bags to sisterhood" exemplifies. Case 1 members can recognize each other offline by the bags that they bring when they meet in person, and many develop closer personal relationships.

Organization 2 began operations in 2011. At first, Organization 2 sold its products through a website and used Facebook for online marketing. In 2016, it initiated an online community ("Organization 2 Fans") on Facebook. By the end of 2017, Organization 2 followed Organization 1 in shutting down its website and selling bags only through its online community. Organization 2 also adopted most of Organization 1's online community rules. Currently, Case 2 has more than 8,000 members. As for Case 1, acquiring bags is a challenging process for Case 2, but is transparent and closely monitored by other members. These similarities make the communities comparable.

#### Data Collection

We used Kozinets' (2010) guide to retrieve texts from online conversations and combined them with data from semi-structured interviews conducted with individual members of the community, as presented in Figure 3. Analysis of online text is a popular methodology for studying online communities due to the permanent nature of text-based messaging (Abedin et al. 2014). As suggested by Kozinets (2010), we selected the interactions between members as the units of analysis, as exemplified in the online community text threads.

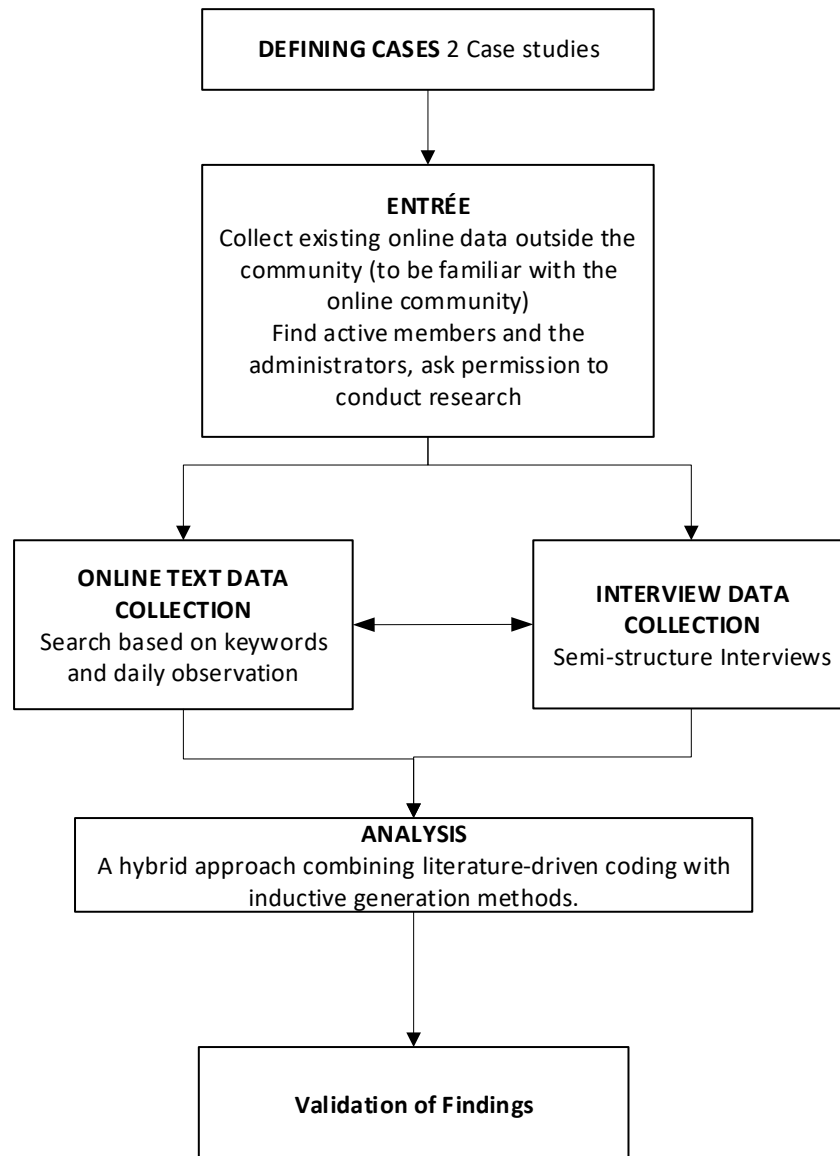


Figure 3. Research design

We piloted the interview protocol on three individuals and discussed the interview questions with two academics with expertise in online community research. Kozinets (2010) and Yin (2018) do not specify a minimum number of participants for interviews when case study research includes more than one data type (i.e. interviews and online conversations), because use of more than one data type increases validity and reliability (Yin 2018). Saturation, as suggested by Kozinets (2010), was reached in this study when no new insights emerged during interviews.

We used a snowballing technique (Myers & Newman 2007) to recruit interviewees. All interviews were conducted in Bahasa, recorded using a digital recorder, transcribed, and subsequently translated into English by the first author (a native speaker of Bahasa). The average length of the interviews was around one hour. After the interviews, the transcripts were shared with the participants for their approval. Follow-up interviews were conducted to confirm and gain more insight into the findings; these involved discussion of the findings with two interviewees who were members of both online communities.

To extract data from online community conversations systematically, we applied the following protocol for identifying keywords based on the results of the initial interviews.

- Our initial interviews confirmed that owning leather bags was very important for community members. Therefore, the first group of keywords related to ways of acquiring bags, including “order”, “bid”, and “barter”.
- We needed to capture threads the organizations’ representatives initiated, so the second group of keywords was administrator names and the owners’ online names. This group of keywords also helped us to track organizations’ activities in the community and how individual participants viewed them.
- The last group of keywords described activities and concepts that many interviewees mentioned repeatedly. They included “fairy godmother”, “mark-up reseller”, and “blacklist”.

After receiving approval from Organizations 1 and 2, we logged into Cases 1 and 2 and downloaded threads that contained keywords identified in interviews. We then appended this dataset with randomly selected seven days of discussions. If sets of threads were repetitive or very similar, then one was randomly selected for analysis. We only included threads with rich interactions, which are important because they represent exchanges between members of the online community (Ivaturi & Chua 2019). The richness of interaction was determined using a combination of subjective and objective assessments (Ivaturi & Chua 2019). On this basis, we included threads with more than one participant (an objective assessment) and those which included substantial new information (a subjective assessment).

We completed data collection – interviews and the text of online discussions – between February and October 2018. Table 3 shows the information and a summary of the data collected for the two case studies.

Table 3. Data collected for Cases 1 and 2

Note	Community	Case 1	Case 2
<b>Background Information</b>			
Number of members		> 20,000	> 8,000
Number of threads in one day		> 20	> 10
<b>Online Text Data Collection</b>			
Year range		2015 to 2018	2016 to 2018
Total number of downloaded threads		417	155
Total number of comments captured		31,247	4,149
<b>Interview Data Collection</b>			
Interviewees		15	11

## Data Analysis

We analyzed the interviews and online discussions to derive a narrative that explains the communities’ activities. Guided by Saldana (2016), data analysis involved a hybrid approach combining literature-driven coding with inductive generation methods. We examined the data for facilitating and constraining factors, as presented in Table 1. This was carried out by analyzing blocks of sentences in online community threads and interview scripts to inductively identify responses about facilitators and constraints that emerged

during the interactions in the online community. We extracted concepts, which we then classified into categories, and subsequently formed into factors.

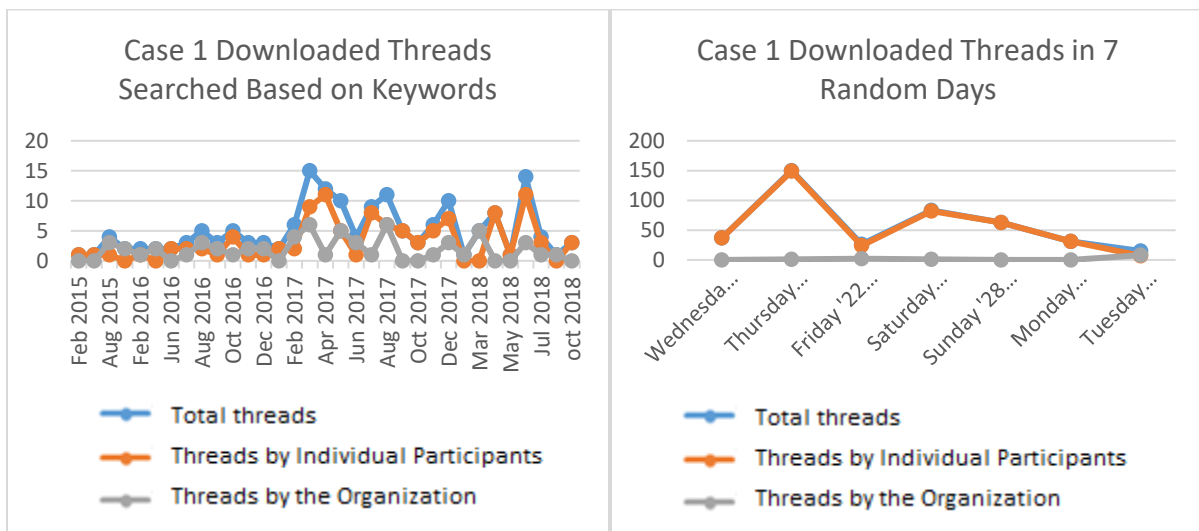
The following is an example of our analytical process. We found that participants in the online community were likely to identify their relationships with other members as “sisterhood”. This was coded as “Sense of sisterhood”, and the concept was categorized under “Community identification”, which was a part of “Sense of Community”. A new factor was developed if categories did not match the factors identified in Table 1. More than 50 temporary concepts were identified and were mapped into 16 factors. Table 4 shows an example of coding.

Table 4. Example of Coding

Overarching Theme	Factor	Category	Temporary Concept Name
Facilitator	Sense of Community	Obligation to community	Share important information
			Don't blame others
		Community Identification	Sense of sisterhood
			Fairy godmother
Constraint	Visibility	Low searchability	Difficult to find comments
			Difficult to find related information

### Descriptive Statistics

Figure 4 shows the number of threads retrieved from each case. Threads produced by participants dominated the conversation. Overall, the number of threads in Case 2 was lower than that of Case 1.



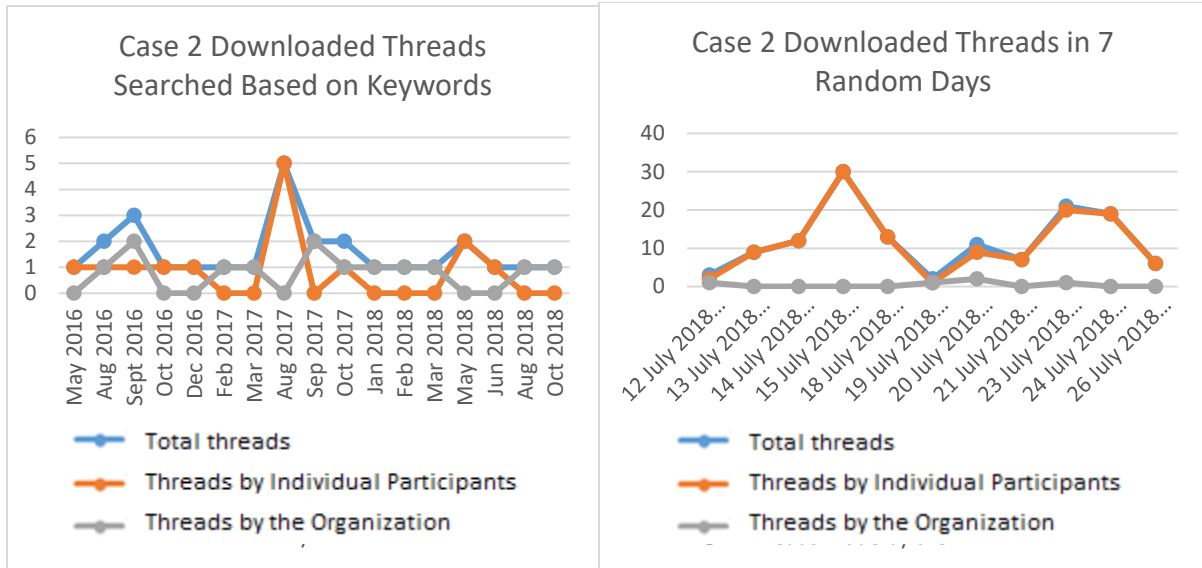


Figure 4. Downloaded threads for Cases 1 and 2

Table 5 presents the demographics of the interviewees by case. Most Case 1 interviewees had been members of the community for over three years, whereas most Case 2 interviewees had been members for two years or less. This is not surprising, because Organization 1 started selling bags on Facebook a few years earlier than Organization 2. Most Case 1 interviewees were aged 35 years or younger, and most Case 2 interviewees were aged 36–40 years. Most interviewees in both cases were in paid employment.

Table 5. Interviewee demographics

	Case 1		Case 2	
	Number of interviewees	Percentage (%)	Number of interviewees	Percentage (%)
<b>Membership Years</b>				
1 year or less	2	13.37	2	9
2 years	2	13.37	5	45
3 years or more	11	73.33	4	36
<b>Age</b>				
30–35 years	8	53	5	45
36–40 years	6	40	6	55
41–45 years	1	7	0	0
<b>Occupation</b>				
Home duties	6	40	3	27
Paid employment	9	60	8	73

## 4. Findings

### Facilitators of Value Co-Creation

Figure 5 illustrates the distribution of facilitators for each case. Technology-related facilitators were dominant in both Cases 1 and 2, but played a bigger role in the latter. Facilitators associated with sociality

in Case 1 were the second largest category of enabling factors, with organization-related facilitators next. The distribution of facilitators in Case 1 shows that the factors related to individuals and the organization played a bigger role than in Case 2. Although individual-related facilitators were the smallest category in both cases, the comparison suggests a more customer-focused environment in Case 1.

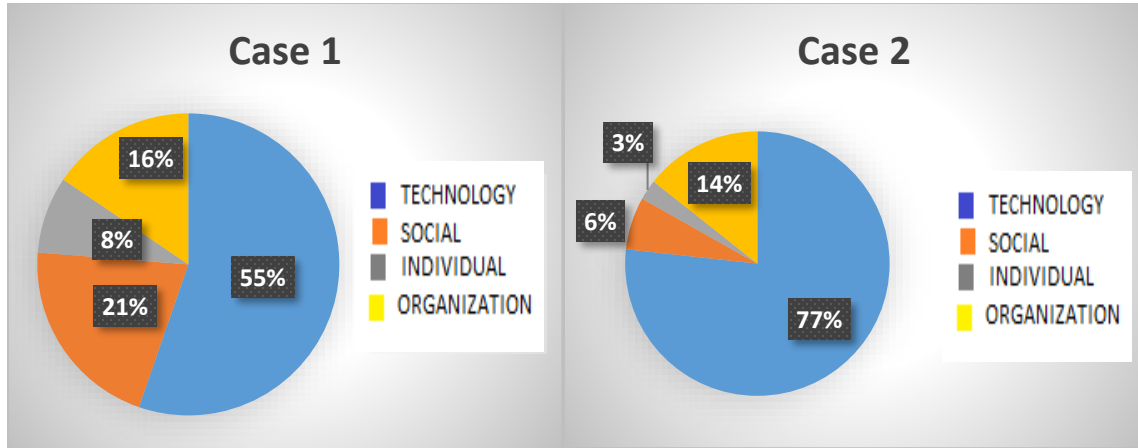


Figure 5. Distribution of facilitators in Cases 1 and 2

As Table 6 shows, association, interactivity, persistency, sense of community, motivation, and participatory leadership were the dominant facilitators across all four actors. For technology, all threads in Cases 1 and 2 contributed to persistence, interactivity, and association. Sense of community appeared in more than half of all threads in Case 1 but in a much smaller proportion in Case 2; the same was true for the organization with respect to the participatory leadership factor. For the individual participant, personal attributes and motivation were associated with similar numbers of threads.

Table 6. Findings from content analysis – facilitators per actor

Actor	Facilitator /category	# Threads in Case 1	# Threads in Case 2	Example excerpt
Technology	1.1 Visibility	88	5	"#barter Lb017 grey to lucy."
	1.2 Persistence	417	155	"please upload the photo to the album."
	1.3 Interactivity	417	155	"Please vote which design you would like us to produce."
	1.4 Flexibility *	22	10	"I am going to turn off comments"
	1.5 Association	417	155	"you need to join the group to pay the bag."
Sociality	2.1 Similarity	20	5	"We come together because we love bags."
	2.2 Sense of Community **	120	9	"My first bag from a fairy godmother"
	2.3 Content Quality **	18	0	"Please be true about your bag condition. Don't hide important information."
	2.4 Equality	4	1	"I think current rules are acceptable and fair enough"
	2.5 Trust	17	2	"I never buy bags outside this community because I believe in fairy godmother in this community"



Actor	Facilitator /category	# Threads in Case 1	# Threads in Case 2	Example excerpt
Individual Participant	3.1 Personal Attributes	28	1	"It is too difficult for me to use this technology. I can't compete with younger members"
	3.2 Motivation	29	5	"we will continue to keep this group until we old."
	3.3 Evaluation Toward the Community	7	0	"This process is super fun"
Organization	4.1 Reward	4	1	"The winner will get free Cbag Mini Kulo Non-Flap."
	4.2 Participatory Leadership **	144	33	"all rules come from members"
	4.3 Transparency **	23	3	"we proudly announce that we have already paid your tax to the government for this month"

\* New factor

\*\* New category emerged under this factor

Several new categories and one facilitator emerged from the content analysis, which contributed to Table 1. Flexibility – the ability to activate and de-activate platform features – is a new facilitator that was categorized under technology. Completeness, which refers to detailed information about bags that participants want to sell or barter, was associated with content quality under sociality. Another new category was equal partnership, which we grouped as part of participatory leadership. The last new category was business transparency, under transparency. Previous research relates transparency to idea generation in innovation (Nambisan & Nambisan 2008). Organization 1 demonstrated not only transparency in the process of idea generation, but transparency in its business practices, such as interactions with suppliers, the workforce involved in bag production, ease of access to financial reports, and discussion of problems the organization faced in production.

The findings outlined above were confirmed through analysis of interview data. Table 7 presents examples of excerpts from interviews with members of Cases 1 and 2. We found evidence for 16 factors of enablers (Table 6); two are new factors, with one revealed during content analysis (flexibility). One new factor, social hierarchy, was found in Case 1 interview data. Case 1 generated more categories of enablers from all actors than Case 2. While considerable variation in enablers was apparent in Case 1 data, enablers found in Case 2 data were fewer and mostly related to the effort of owning bags.

Table 7. Facilitators identified in Cases 1 and 2 interview data, and example text

Facilitator factor	Category	Case 1 example text	Case 2 example text
Participatory Leadership	Activity Development	<i>"we have various games"</i>	<i>Not found</i>
	Participation in Decision-Making	<i>"our member acceptance process, new members should be selected by us first before accepted by the organization"</i>	<i>"some people want to be fair... they check it carefully and report the mistakes to the organization"</i>

Facilitator factor	Category	Case 1 example text	Case 2 example text
	Formal and Informal Communication	<i>"if we buy a product and the owner treats us nicely, who will not be happy?"</i>	<i>Not found</i>
	Equal Partnership	<i>"She is just the same as us, the member of this community"</i>	<i>Not found</i>
Sense of Community	Obligation to Community	<i>"This quiz is for members who were born on 28 October"</i>	<i>"I think current rules are acceptable and fair enough. Please don't make things difficult for the organization. Let them concentrate on the production"</i>
	Community Identity	<i>"My first bag from a fairy godmother. My beloved bag"</i> <i>"From bags to a family"</i>	<i>"your days with Case 2: Monday is wish list day, Tuesday is barter day..."</i>
	Social Bonds	<i>"We are more than bag lovers; we are sisters"</i>	<i>Not found</i>
Social Hierarchy	Social Hierarchy	<i>"I think area coordinators are very important people. They lead us and inform us about rules and norms in our community"</i>	<i>Not found</i>

### Constraints on Value Co-Creation

We identified seven constraints from content analysis and 10 from interviews. Personal attributes was the only constraint found in both Cases 1 and 2. Examples of excerpts from online texts and interviews are presented in Table 8.

Table 8. Examples of constraints identified in Cases 1 and 2 (online text and interviews)

Constraint factor	Category	Example excerpt	Found in (✓ = found, X = not found)	
			Case 1	Case 2
<b>Online Texts</b>				
Participatory Leadership	Low Activity Development	<i>"Today is not a barter day, please stick to the schedule!"</i>	X	✓
Transparency	Low process Transparency	<i>"what had happened? Why did the admin block me? What mistakes I had done?"</i> <i>"If we block you it means that you bother us. Think about it by yourself"</i>	X	✓
Visibility	Limited Searching Tool Ability	<i>"I have already submitted a comment, but I could not find it"</i>	✓	X

Constraint factor	Category	Example excerpt	Found in (✓ = found, X = not found)	
			Case 1	Case 2
	Inappropriate Information Centre	<i>"I remind you, this is Friday, stop postings and comments. You may make us miss the post from the organization"</i>	✓	X
<b>Interview</b>				
Participatory Leadership	Low Participation in Decision-Making	<i>"The rules are too strict... Too much control"</i>	X	✓
Personal Evaluation	Affective Evaluation	<i>"Get bored, I am easy to get bored"</i>	X	✓

An important finding was that a facilitator may constrain value co-creation, or vice versa, in certain situations. An example is technology's auto-updated timeline feature (visibility). Facebook sorts threads on the timeline based on the latest activities; the thread with the latest activities will be displayed on the top. However, there are days when most participants only want to see posts from the organization. If a member posts something on that day, that thread will appear first and other members might miss the chance to see the organization's post. On the other hand, if a constraint is properly handled, it can turn into a facilitator. For example, for some older members in Case 1 (aged > 50 years), it was almost impossible to keep up to date with the latest information; this made it difficult for them to acquire bags. To address this, Organization 1 created a special group for older women and offered them an easier way to acquire bags. This solution strengthened the sense of community among these members and was much appreciated.

#### Summary of Findings from Cases 1 and 2

As Table 9 shows, supporting evidence for 17 facilitators emerged from the content analysis and interview data. This indicates the addition of two new facilitators to those reported in our review of the literature in Table 1. The first one is social hierarchy, which reflects an evolving social structure in the community that helps it to informally understand the lines of communication between individuals and also between the organization and individuals. The second facilitator was flexibility, which describes the individuals' ability to turn on or off particular features of the technology to cater to their needs.

Table 9 presents 11 constraints, seven of which were not found in our review of the literature: low transparency, personal evaluation, social hierarchy, low sense of community, low association, privacy, and low trust. Interview analysis revealed more constraints than content analysis because interviews allowed interviewees to express their opinions and enabled us to probe more deeply.

Table 9. Facilitators and constraints identified in Cases 1 and 2

Actor	Facilitator/constraint factors	Found in (✓ = found, X = not found)		
		Case 1	Case 2	SLR
Organization	<b>Facilitator</b>			
	Reward System	✓	✓	✓

Actor	Facilitator/constraint factors	Found in (✓ = found, X = not found)		
		Case 1	Case 2	SLR
	Participatory Leadership	✓	✓	✓
	Transparency	✓	✓	✓
	<b>Constraint</b>			
	Low Participatory Leadership	X	✓	✓
	Low Transparency	X	✓	X
	Reward System	X	X	✓
	<b>Facilitator</b>			
Individual Participant	Motivation	✓	✓	✓
	Personal Attributes	✓	✓	✓
	Personal Evaluation	✓	X	✓
	<b>Constraint</b>			
	Personal Attributes	X	✓	✓
	Personal Evaluation	X	✓	X
	<b>Facilitator</b>			
Sociality	Similarity	✓	✓	✓
	Sense of Community	✓	✓	✓
	Content Quality *	✓	X	✓
	Equality	✓	✓	✓
	Trust	✓	✓	✓
	Social Hierarchy *	✓	X	X
	<b>Constraint</b>			
	Social Hierarchy *	✓	X	X
	Low Sense of Community	X	✓	X
	Low trust	✓	X	X
	<b>Facilitator</b>			
Technology	Visibility	✓	✓	✓
	Persistence	✓	✓	✓
	Interactivity	✓	✓	✓
	Flexibility *	✓	✓	X
	Association	✓	✓	✓
	<b>Constraint</b>			
	Low Association	✓	X	X
	Low Visibility	✓	✓	✓
	Privacy *	X	✓	X

\* New constraint/facilitator

## 5. Discussion

Our first research question was: what are the factors that facilitate and constrain value co-creation in organization-sponsored online communities as fluid settings? We identified facilitators and constraints for each of the four actors (see Table 2) involved in the value co-creation process. In this section, we discuss the novelty of our findings with respect to our first research question, then answer the second research question about the dynamic relationship between the facilitators and constraints in the online

communities we studied. Finally, we discuss the practical implications of our findings for managing online communities for co-creation of value with various actors and present the theoretical implications.

### New Facilitators and Constraints

Our findings extend the previous literature on facilitators of value co-creation in online communities by uncovering three new categories of transparency, participatory leadership, and content quality. Findings also revealed two new factors under technology: flexibility (a facilitator) and privacy (a constraint), and one new facilitator, social hierarchy, that can work as a facilitator or a constraint. These factors are discussed below.

- *Transparency*: Previous researchers primarily viewed transparency as the transparent process of idea generation and implementation, such as the selection of ideas, the process of idea implementation, and the final results (Hasan & Rahman 2017; Nambisan & Nambisan 2008). Our findings show that transparency includes not only the process of idea generation and implementation, but also business transparency. For example, Organizations 1 and 2 shared internal information on their supply chains, internal processes, and financial reports. Organization 1 published the names and contact details of their suppliers; members of Case 1 can contact these suppliers for information about the raw materials and the processes that Organization 1 uses to select leather for their bags. While financial reports do not encourage members to develop more ideas for this community, Organization 1's announcements about revenue and tax seemed to further motivate its members to participate, which can increase the chance of sharing ideas. Members of the community reported enjoying being part of the growth of this enterprise. Knowing the challenges the organization faces, such as retaining skilled employees and maintaining the supply of raw materials, improved members' understanding of the business and increased their identification with the business.

This type of transparency has already been demonstrated in the business-to-business relationships literature (Dyer & Singh 1998). Our study adds to the literature in showing that transparency can also be applied to business-to-customer relationships to develop services that help the business survive in the marketplace.

- *Participatory leadership*: Most previous studies relate participatory leadership to customers' development of ideas for the sponsoring organization (Chen et al. 2012; Gebauer et al. 2013; Kohler et al. 2011; Nambisan & Nambisan 2008). Participatory leadership involves leveraging the power of community members to produce benefits for all other members. Findings of our earlier SLR (Priharsari et al., 2020; Priharsari et al., 2019) revealed that this relates to sharing decisions and opinions freely. In this study, we found an additional way through which Organization 1 exercises participatory leadership. It explicitly refers to an equal partnership between itself and the community members and urges the organization and individual members to grow together. Furthermore, participation in decision-making, a category under participatory leadership, was manifested in various ways. Previous researchers discussed participation in decision-making in product/service development (Gebauer et al. 2013). Findings from Case 1 revealed that participation in decision-making can also be applied in processes such as filtering and nominating new members, controlling the distribution of bags, monitoring the process of bag orders, and taking part in developing community rules.

- *Content quality* refers to the usefulness of content discussion and the balance between personal opinion and factual information (Laing et al. 2011; Seraj 2012). The findings demonstrated that content quality is important for Cases 1 and 2, particularly when related to buy, sell, and barter transactions. Both cases provide detailed descriptions of bags that are sold or bartered in one thread (Completeness).
- *Flexibility* is the ability to activate and deactivate features of the platform. It is very important to support daily events in both communities. The “turn off comment” feature of Facebook can be used to stop a discussion and reduce conflict. Although individual participants may create more threads to have new discussions, the feature indicates that a particular discussion should be stopped. The turn on/off comment feature can also be used playfully: the online communities use it as a tool to make the ordering process (which they call “the fight”) more fun. For example, within two minutes, a poster may use the turn-off comment feature, so that no one can bid for or order bags; this makes the ordering process more difficult and at the same time allures individual participants. Other features that afford flexibility include “set privileges” and the flexibility to select the channel of communication, such as personal chat or public comments.
- *Privacy*. Managing privacy in online platforms is difficult. Some interviewees felt that sharing images is dangerous, for example, worrying that an irresponsible member could steal an image and use it inappropriately. However, concerns about privacy did not prevent them from participating; they used a simple technique of adding identifying characteristics to the middle of their images to prevent misuse. For others, privacy was not a concern.
- *Social hierarchy* means group members vary in their level of power, influence, or dominance. This factor was both a facilitator and a constraint. An obvious social hierarchy was detected in Case 1. As the community grew, local area groups also grew in number. Each local area has one leader called the area coordinator, selected by the members, who oversee their local area groups. Most interviewees agreed that area groups make the online community group more enjoyable. The area coordinators also helped their members to stay informed about important matters, such as when the organization was releasing a product. However, some participants did not like this hierarchy because it made them feel powerless.

Further to the above, we found that unlike members’ employment status, the length of membership and the member’s age, were important factors in facilitating participation in Case 1. The longer a member actively engages in the online community and the more she is known by others, the higher the chance for her to be selected as the leader of a local group. However, older members seem to be less likely to become the leader of a local group due to less familiarity with the technology. Moreover, in active and vibrant online communities such as Cases 1 and 2, frequent updates and conversations are part of the routine. As Case 1 demonstrates, members older than 50 need assistance to keep up with the rest of the community.

#### Dynamic Nature of Facilitators and Constraints

Building on recent characterizations of online communities as fluid organizations (Bailey et al. 2019; Faraj et al. 2011; Nielsen 2018), as well as organizations’ increasing interest in information technology-based value co-creation in collaboration with multiple parties (Westergren et al. 2019), our findings revealed that any facilitator can act as a constraint or vice versa depending on the community, individual perceptions, and other circumstances. This leads to a dynamic tension between facilitators and

constraints in the online community. For example, technology's auto-updated timeline is a feature that can act as a constraint and as a facilitator simultaneously. As a facilitator, it helps members to receive timely information about activities in the community; as a constraint, it was perceived as annoying to some members, especially during the fight in Case 1. Another example is social hierarchy in Case 1. For some participants, it helps to clarify roles and responsibilities, whereas for others it distances them from each other and inhibits participation in the community.

If a constraint is managed properly, its effect can be curbed to facilitate value co-creation. For instance, Case 1 created a group for women aged over 50 years (50-plus), many of whom found using the community difficult. They needed more time than younger users to read updates and respond to them, which was a challenge in an active community with up to 100 new threads per day. The new group of 50-plus members created a strong sense of community. The group was also well promoted in the online community, which encouraged younger members to help 50-plus members to continue their participation in the community. The organization also provided 50-plus members with new ways to acquire bags so they did not have to go to the fight to get them. All these initiatives led to more constructive interaction between 50-plus women and younger members, which consequently helped to shape sociality. These examples show that facilitators and constraints are not always two sides of the same coin but can be subjective and situational.

Actions may trigger each other or occur concurrently, which leads to a dynamic tension in the online community. These tensions fluctuate with changes in members and the interactions between them. As discussed above, while some may perceive particular features of the technology as helpful, some others may find such features annoying and distracting. Some members may regard the intensity of online discussions as a sign of strong connection; others may perceive high-intensity public communication as a barrier to joining the conversation.

These dynamic tensions may have negative consequences, such as a decrease in the number of active members. However, Faraj et al. (2011) argued that fluidity can provide opportunities for collaboration when the community responds in ways that encourage interactions. Managing tensions and adaptation to the tensions is important, and it is the sponsoring organization's responsibility to make an appropriate response that encourages interactions (Majchrzak et al. 2016). This means that the sponsoring organization should continuously inspire customers to participate and cooperate. Therefore, the ability to enact participatory leadership, which focuses on listening and responding to customers proactively – such as developing playful activities, involving participants to produce decisions, and sharing tasks in the online community – is important. It helps the sponsoring organization to adjust the online community to the current tensions and minimize the negative consequences. As demonstrated earlier, Organization 1 won members' loyalty by recognizing the needs of 50-plus women and providing them with new channels that helped them to participate in the community.

From a sociomateriality perspective, individual participants and organizations, as the human actors, adapt to the technology if they see it as an enabler for achieving their objectives (Leonardi 2011). On the other hand, if technology constrains them in achieving their goals, they will try to change it to fit their purpose. During these changes, sociality will come up against constraints; then the cycle repeats, and either the individual and sociality or technology will change. The model continues creating cycles that change the organization gradually. This finding echoes Barrett et al.'s (2016) assertion that value creation in online communities is generated through the ongoing sociomaterial configuration of technology and other

actors. Their study showed that multiple kinds of value were produced and changed over time alongside changes in sociomaterial configuration. Our study extends Barrett et al.'s findings by revealing the interactions between actors within a sociomaterial configuration and how that affects the actors, rather than seeing it as an entangled configuration.

Sociomateriality, as proposed by Leonardi (2011), was based on a case study of an organization in which all employees worked under formal contracts. This means that the study's model implicitly assumes that individual participants and organizations share the same perspective on the problem. Our study offers a new way to understand facilitators and constraints in a fluid organization in which participants have varying expectations and the freedom to leave. Our findings show that facilitating and constraining factors are subjective concepts, due to the multiple and sometimes contradictory goals of participants in an online community. One participant may believe a particular situation enables her to do what she wants, yet another may think differently, as Volkoff and Strong (2013) showed. This implies that interpretations of the technology, described by Volkoff and Strong (2013) as strands of interpretation, are subjective. These strands become intertwined or concatenated, which eventually continuously changes the organization. It also explains why the same technology may produce different phenomena across settings. In the context of online communities, strands create dynamic tensions. The different ways that online communities respond to the tensions create different changes in the organization, as outlined in the next section.

### Managing Online Communities as Fluid Organizations

The findings from both Cases 1 and 2 reveal those aspects of a fluid organization that should be focused on to co-create value. From a sociomateriality perspective, we identified four actors in online communities that are involved in value co-creation. As a fluid organization, an online community faces a dilemma between encouraging fluidity and stability. An organization-sponsored online community is an organization in which individual participants can join and leave easily, while the sponsoring organization must stay. However, Organization 1 has found a way to overcome the dilemma between stability and fluidity by strengthening its organizational identity embedded in the social domain. A strong organizational identity is important to coordinate participants with diverse goals and personal identities (Schreyögg & Sydow 2010). Case 1's strong community identity is evidenced by sense of community as per the tag "from bags to a family". This identity represents a stable foundation that allows all participants in the online community to contribute. As a result, Case 1 has higher participation and a more vibrant community than Case 2.

Case 1 also demonstrated how a sponsoring organization can exercise participatory leadership. The organization shares control over the community by sharing tasks and developing community rules in collaboration with individual participants. Findings about Organization 1 confirm that in the online community, the organization is equal to individual participants. Organization 1 developed task-sharing routines for managing bag orders, registering and filtering new members, and identifying mark-up resellers, which are all group activities rather than individual actions. Individual participants took an active role and initiated ideas and actions. There were also times when the organization asked individual participants to contribute to decisions about the community. By allowing individual participants to have agency, the organization nurtured interactions in the online community. This is similar to the idea of distributed leadership, in which group members lead each other (Harysi et al. 2019). In online communities, leadership is not the responsibility of an individual, but shared among members.



As noted earlier, Organizations 1 and 2 are among the top five leather bag brands in Indonesia, with Organization 1 ranked above Organization 2 (Dian 2018). To increase its market share via improved online community engagement, Organization 2 has adopted most of Organization 1's rules, particularly related to bag orders. Although its members have a similar profile (age, gender, and passion) and use the same technology (Facebook), Organization 2 has not succeeded in developing a community as vibrant as Organization 1's. Case 2 has not developed its sociality as effectively as Case 1, showing that replicating procedures and routines are not sufficient to obtain the full advantages of an organization-sponsored online community.

### Contributions and Theoretical Implications

This study developed a comprehensive set of facilitators and constraints based on the four actors identified from the literature review as well as through two comparative case studies. The findings of this study have shown that to master the dilemma of fluid organizations, the sponsoring organization should develop a strong sense of community that is embedded in sociality. In a social system such as organizations, the organization must establish and maintain an identity that distinguishes it from its environment. The case studies show that in online environments, the same principle can be applied. Another of our novel findings is the importance of the organization exercising participatory leadership. Participatory leadership allows power to be distributed from the sponsoring organization to the members of the online community.

The critical realism approach to sociomateriality proposed by Leonardi (2011) sees constraints as the absence of affordances. Our study has produced some paradoxical results, such as ability for Facebook's auto-updated timeline feature to be experienced as both enabling and constraining for members of the community. In this context, affordances are not only enabling, but also constraining. In a fluid organization, such as an online community, it is almost impossible to make sure everyone understands everything in the same way. Members tend to have a variety of diverging purposes that cause them to see things differently. Therefore, it is unsurprising that the same affordances would be enabling for some members and circumstances and constraining for others. The simultaneous existence of facilitators and constraints for individuals is not captured in the sociomateriality model (Volkoff & Strong 2013).

The findings and discussion above reveal how individual members of an online community and the sponsoring organization change their understanding of technology and their social structure. Meanings are continually negotiated through repeated interactions as differences are clarified. When people perceive a similar meaning or use the same subset of technology features, they can see similar facilitators and constraints. They are also able to develop social arrangements to overcome technology constraints; this is when technology influences social structures. On the other hand, when people share similar objectives, they see technology as a material entity that can help them achieve their goals. They use technology creatively to aid their social processes and change the structure of the technology by recombining it with other technologies or by changing its meaning; this is when social activities influence technology structures and meanings. These processes continually reshape the social and technological aspects of the online community. Thus, this study shows that technology, as a material, grows organically alongside socially shared meaning, while simultaneously, sociality grows organically alongside a shared meaning of technology.

Sociomateriality phenomena are described using two types of changes. In sociomateriality theory, changes are described as sequences of iterative changes to social practice until the technology constrains

it, eventually forcing changes to the technology. While this model is important to an understanding of the existence of two types of agency (human and material), it does not capture the constraints, affordances, and changes in sociality and technology that occur subjectively in a fluid organization which participants are free to join and leave. The dynamics of the facilitators and constraints can be considered as strands of understanding of the sociomateriality phenomena occurring in each individual. Then, interactions in the online community allow adjustment of these personal understandings to produce a communal understanding of constraints and facilitators.

Our study has implications for organizational theory, particularly concerning the fluid organization. We provide evidence that the dilemma of the fluid organization can be resolved through a strong organizational identity embedded in sociality. Social systems such as organizations must establish and maintain identities that distinguish them from their environments. The case studies show that in online environments, the same principle applies.

### Practical Implications

The first major practical achievement of our study is the assessment of facilitators and constraints associated with value co-creation in online communities. We developed a novel set of facilitators and constraints consisting of factors and categories that can guide practitioners in evaluating a community of interest and its role in value co-creation. This can also help sponsoring organizations and developers to determine the functionality and the support needed to encourage their members to participate in value co-creation.

Second, our findings emphasize the important role of sense of community and participatory leadership, and the lesser but still important role of reward systems, in organization-sponsored online communities. They align with the work of Gebauer et al. (2013), who mentioned the importance of sense of community in maintaining value co-creation in online communities and helping sponsoring organizations to focus their strategies on nurturing their online communities. Further, they serve to encourage system developers to support a sense of community and improve an organization's participatory leadership as central strategies in developing platforms for co-creation communities.

## 6. Conclusion and Recommendation for Future Research

We investigated facilitators of and constraints on value co-creation in organization-sponsored online communities. This was achieved by identifying four actors informed by sociomateriality. In identifying the facilitators and constraints in a fluid organization (an online community), we demonstrated the dynamics of fluid organizations and their critical success factors. In this way, we addressed previous calls to examine the interactive dynamic of socio-technical environments in creating value. Furthermore, we extended the facilitators and constraints derived in our earlier SLR using evidence from research into communities of interest. This comprehensive set of facilitators and constraints can help community managers to examine and improve the performance of their online communities. In particular, we found that sense of community and participatory leadership, and to a lesser extent reward systems, play a critical role in nurturing online communities and helping organizations establish and maintain an identity that distinguishes their community from the external environment and the competition.

We revealed the existence of interrelationships between each facilitator and each constraint of value co-creation in sponsored online communities. We found that one facilitator could act as a constraint or facilitator depending on the community, individual perceptions, and other circumstances. These findings

highlight the subjectivity of facilitating or constraining roles, emphasize the situational nature of these factors, and expand our understanding of sociomateriality. While Leonardi's (2011) critical realism approach to sociomateriality considers constraints as the absence of affordances, our work uncovered paradoxical results that suggest that in fluid organizations like online communities, affordances are not only enabling but constraining. Further research could theorize the contradictory relation between these factors and how such relations can shape value co-creation in fluid settings, such as online communities. Moreover, future research is needed to investigate the potential causality between and within constraints and facilitators. For example, visibility in technology may affect equality in sociality and transparency provided by the sponsoring organization; social hierarchy may lead to inequality within the community.

Further clarification of the nature of individual facilitators and constraints is needed. For example, while sense of community is known to be an important facilitator of participation in online communities (Gibbs et al. 2019; Kim et al. 2008), it is difficult to develop and may not be important in competition-based online communities (Hall & Graham 2004). Other research has identified a trade-off between sense of community and the anonymity of participants (Zhang, Pan, et al. 2019). Our study determined that sense of community was the dominant facilitator under sociality (Table 6). Future studies could produce more evidence about the importance of sense of community in online communities and explore how it can be developed.

Although the findings reveal the importance of community identity in a fluid organization and facilitators that support value creation, we did not explore the relationship between organizational approaches and technology in the development of community identity in organization-sponsored online communities. Future studies could focus on the development of online community identities and how organizations and technology facilitators contribute to their development. Our findings should also be interpreted in the knowledge that all participants were female, and that the homogeneity of culture and gender in both case studies may bias the results. For example, some researchers suggest women are (on average) more anxious and less confident than men about using digital technology (Hee & Freeman 2012), which may affect the generalizability of our findings to samples involving men. Cultural values may affect technology readiness and acceptance, because members of online communities in different countries and cultures may behave differently. Lastly, the study involved only two online communities, potentially limiting the generalizability of the findings. Nonetheless, we believe the approach generated valuable and novel information about sponsored online communities.

## 7. Acknowledgements

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Appendix I

actor	Factor	Category	Explanation
Firm	Participatory leadership	Formal and Informal Communication	The development of ways to engage in formal and informal by for example: a dedicated firm representation to bridge communication, procedure to respond to customers, foster informal sociability (Chen et al. 2012; Kohler et al. 2011; Nambisan & Nambisan 2008).
		Participation in Decision-Making <i>Constraint: low participation in decision-making</i>	The development of plan to engage community members in management and decision-making (Gebauer et al. 2013) <i>Low participation in decision-making (Ind et al. 2013)</i>
		Creative Customer Identification	Refers to leaders' tendency and mindset to engage creative customers in creation of value and support their initiatives and innovative ideas. (Hasan & Rahman 2017; Nambisan & Nambisan 2008)
		Activity Development <i>Constraint: low activity development</i>	Refers to promoting and opening opportunity for co-creation by developing a form of play rather than intended seriously with all customers as co-partners (Hasan & Rahman 2017; Kohler et al. 2011) <i>Low activity development (Ind et al. 2013)</i>
	Reward systems	Monetary reward system	Monetary related reward systems (Füller 2006; Hall & Graham 2004; Hasan & Rahman 2017; Nambisan & Nambisan 2008)
		Reputation Mechanism	Reputation gained as a result of co-creation participation or other non-monetary rewards. (Jeppesen & Frederiksen 2006; Nambisan & Nambisan 2008)
		<i>Reward suitability</i>	<i>Suitability the reward selection with the nature of challenges and participants (Hall &amp; Graham 2004)</i> <i>Taken from constraint: unsuitable reward selection</i>
	Transparency	Customer Role Transparency	The clarity and transparency of roles of customers in co-creation participants (Nambisan & Nambisan 2008)
		Process Transparency	The clarity and transparency of processes related to the firm and participant relationship, including the nature of the processes, who is involved, the time sequence (Hasan & Rahman 2017; Nambisan & Nambisan 2008)
		Outcome Transparency	Keeping customers informed about what is happening to their inputs (Nambisan & Nambisan 2008)
Individual	Motivation	Benefits	Benefits from interaction in the community, such as: monetary reward, show ideas, gain knowledge, intrinsic motives, curiosity (Constantinides et al. 2015; Fernandes & Remelhe 2016; Füller 2006; Nambisan & Baron 2007; Schaedel & Clement 2010)
		Expectation	A belief about what benefits that will be received in the future (Füller 2010)

actor	Factor	Category	Explanation
		Commitment	Commitment is enduring desire to continue a relationship accompanied by his willingness to make efforts at maintaining it (Brodie et al. 2013; Bugshan 2015; M. Kang 2014).
	Personal attributes	Current Skills and Knowledge <i>Constraint: Low skills</i>	Current state of skills and knowledge of the persons (Füller 2010; Jeppesen & Frederiksen 2006) <i>low skills (Harrison &amp; Waite 2015; Wu &amp; Fang 2010)</i>
		Personality Type	A personality type is unique characteristic patterns of a person (Füller 2010; Hasan & Rahman 2017; Mai & Olsen 2015; Ståhlbröst & Bergvall-Kåreborn 2011)
		Personal Value	Personal values are defined as concepts or beliefs about desirable end states or behaviors that transcend specific situations, guide selection or evaluation of behavior and events, and are ordered by relative importance (Mai & Olsen 2015)
	Personal evaluation towards the community	Affective Evaluation	Customers' attribution of positive feelings generated from their interactions in the community (Nambisan & Baron 2007).
		Experience	Personal experiences related to the co-creation process (Blasco-Arcas et al. 2014; Füller 2010)
		Value Equity	Value equity represents a customer's assessment of what is given up (i.e. the price paid for the product) compared to what is received in return (value), for example: a good price-quality ratio points to high-value equity (M. Kang 2014)
Social	Sense of community	Social Bond	A sense of membership or connectedness to others in the community that develop reciprocal take and give. This also refers to connection and emotional bonds. (Brodie et al. 2013; Gebauer et al. 2013; Hall & Graham 2004; Misra et al. 2008; Pongsakornrungsilp & Schroeder 2011)
		Community Identity	Refers to creation of the codes, norms, and tradition that become community identity (Healy & McDonagh 2013; Pongsakornrungsilp & Schroeder 2011)
		Obligation to the Community	A sense of responsibility to assist others in the collective. This includes peer feedbacks (Bugshan 2015; Chen et al. 2012; Laroche et al. 2012; Wiertz & de Ruyter 2007)
	Trust	Integrity Trust	Trust to others, that other members will follow generally accepted rules (Laing et al. 2011; Seraj 2012; Zhao et al. 2015)
		Benevolence Trust	Trust to others, that other members are genuinely concerned about their welfare and benefits (Seraj 2012; Zhao et al. 2015)
	Similarity	Shared Interest	Refers to the similarity of interest to a particular objects (Brodie et al. 2013; Misra et al. 2008)

actor	Factor	Category	Explanation
	Content Quality	Members' Commonality	Refer to similarity of experiences, vision, background, and knowledge (Zhao et al. 2015)
		Usefulness of Content Discussion	The discussion is useful for its participants (Laing et al. 2011; Seraj 2012)
	Equality	Balance Between Personal and Facts	The balance amount of information between personal experience and facts (Laing et al. 2011)
		Norm of Reciprocity	Refer to the norm of people should help those who have helped them by returning equivalent benefits. (Wiertz & de Ruyter 2007)
		Perceived of Fairness	Refer to the fairness of interactions and non-written rules in the online community (Gebauer et al. 2013)
Technology	Association	Interpersonal Relationship	It is also called as social tie technological features which refer to features that support interpersonal relationship, such as add friends, add group, etc. (Blasco-Arcas et al. 2014; Nambisan & Nambisan 2008)
		Association between Individual and Content	Refer to features that support relationship of individual with a piece of information, such as contributor list, tagging (Nambisan & Nambisan 2008)
	Interactivity	Social Translucence	Design features that provide customers with social cues that offer richer social experiences and permit richer customer discussions, such as emotion, feeling, etc. (Hasan & Rahman 2017; Nambisan & Nambisan 2008)
		Interactive Feature	Refer to embedding social network and media web-based technologies to create highly interactive platforms. This includes develop interactive features such as sharing, posting, commenting, virtual locations (Hasan & Rahman 2017; Kohler et al. 2011; Misra et al. 2008; Seraj 2012)
		Virtual Reality	Simulation tools that combine technology and human interactivity to produce stimulating experiences (Füller et al. 2009; Kohler et al. 2011; Nambisan & Nambisan 2008)
	Persistence	Accessibility	Refer to online platform constant availability and reliability (Hasan & Rahman 2017)
		Consistent Presentation	Refer to constant format and presentation of data that is input to the system (Booth & Kellogg 2015)
	Visibility	Rating System	A system that provides information about the rating of a product. This includes review, number of likes, etc. (Nambisan & Nambisan 2008)
		Information Centre	A system that can feed customers the right knowledge and information at the right time. (Nambisan & Nambisan 2008)
		Usability <i>Constraint: Complex feature</i>	Having a simple, easy-to-use customer interface combined with fast and highly intuitive navigation features. This includes attractiveness and clarity of the instructions

actor	Factor	Category	Explanation
			and contents. (Cheung & To 2016; Hasan & Rahman 2017; Kohler et al. 2011; M. Kang 2014; Nambisan & Nambisan 2008; Zhang, Lu, et al. 2015)
		Searching Tool	Refer to feature that helps participants to search. For example, "LibraryTool" enabled a group of educators to search particular knowledge written by peers. (Booth & Kellogg 2015)