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Drivers and mechanisms for online communities performance: A systematic literature review

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ABSTRACT

The health crisis has highlighted online communities' interest and effectiveness in connecting isolated people in response to urgent problems or to recreate social links. However, despite much research over the last 30 years, there is no global vision regarding the conditions and processes that act on such communities' dynamism and allow them to reach their objectives. In other words, the conditions for online community performance have not been fully investigated. Online community performance relies on the presence of mechanisms such as socialisation, structuring, participation, commitment and common motivations. Those mechanisms are favoured by a multitude of drivers identified in the literature. This paper is aimed at presenting the current state of research on the conditions that affect online community performance. We conducted a systematic literature review of 529 sources and identified, through a selection of 178 articles, the dimensions where the understanding of performance is rarer, such as drivers related to contributions and those affecting the common motivation mechanism.

1. Introduction

With the outbreak of the global COVID-19 pandemic, societies, economies and the daily lives of individuals have been severely disrupted. The sequence of lockdown periods of varying levels of severity has prompted citizens to adapt to living and working in their homes for most of the time. Leisure activities involving social gathering were no longer permitted, with bars, restaurants, exercise and fitness spaces and cultural centres all closed. The elimination of public spaces where people existed in physical proximity drove individuals to engage in activities of exchange, action and entertainment that were still accessible from home, i.e., those activities facilitated by the Internet. Internet usage, and the variety of web-based activities, have increased in scale and scope considerably during the pandemic period (Bourdeau-Lepage, 2020). The public health crisis has prompted people around the world to look for help online (for victims of the virus, for health professionals, for teachers and for isolated individuals); they have also sought out online forms of entertainment (e.g., organising online sports events, cultural meetings, remote challenges, and video games) and online means of experiencing human connections (Djurdjić, 2021; Masson & Parmentier, 2020).

The pandemic period has thus created an extremely favourable context for the emergence of new online communities and the growth of existing ones. In 1997, Wilbur considered the term *virtual communities* to be a neologism undergoing the process of becoming an emerging research field (Wilbur, 1997). The topic of online communities now constitutes a distinct and diverse field of research which seeks to determine the mechanisms and drivers of effective performance. Online communities have a multidisciplinary appeal. The information sciences are particularly interested in those matters relating to the digital interface and the means of technical exchange between individuals (Nepal, Paris, Pour, Freyne, & Bista, 2015; Olson & Neal, 2015; Wang, Ow, Liu, Feng, & Liang, 2020). Management sciences often study online communities' various forms of governance and organisation, both external and internal and knowledge management (Amine & Sitz, 2007; Cohendet, Créplet, & Dupouët, 2003; Faraj, Jarvenpaa, & Majchrzak, 2011). The field of sociology has conducted extensive research into the interactions between community members and the relationship(s) between the individual and the online community (Amin & Roberts, 2008; Proulx & Latzko-Toth, 2000). This literature review is therefore anchored in a broad scientific and social science context in which numerous studies across a wide variety of fields have explored the phenomenon of online communities. Studies to date, however, have only systematically addressed some of the elements central to their performance in a specific field (i.e., from the respective angles of participation, organisation, or technology) (Confente & Kucharska,

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2021; Preece, 2001; Wu, Xie, Xiao, & Xie, 2018). *Performance* in this respect pertains to a community's capacity to achieve its goals and satisfy its members (Kotler, 1984). Many of the conditions for effective online community performance have been identified within the confines of each of the above-mentioned disciplines. Research into online community performance remains, however, fragmented when it comes to discerning the definition, mechanisms, and drivers of that performance in a way that integrates these various disciplinary explanations. While a range of studies has offered valuable insights thus far, an interdisciplinary mapping of the conditions of performance has not yet been developed. Developing such a map will enable researchers and practitioners to deepen knowledge of how online communities function and what makes them develop, grow, and decline. The purpose of this paper is thus to identify, analyse, and synthesise evidence to answer the core research question: *What are the mechanisms and drivers of online community performance?*

We conducted a systematic review of the available literature to gauge its validity and comprehensiveness (Paul & Criado, 2020). To provide a valuable contribution to the wider body of research into online communities, we focus on theoretical and empirical studies that address *performance* specifically. We searched widely in the literature within and across the full range of social sciences, computer science, and other fields. We selected 178 studies published between 2001 and 2021. We identified five mechanisms from the literature that affect the performance of online communities, and we synthesised the performance literature review via a mapping of 24 drivers influencing performance mechanisms, which in turn were grouped into four thematics.

The paper is organised as follows: Section 2 outlines and unpacks the concept of online communities and their intrinsic processes, and then identifies and defines the concept and various aspects of performance. Section 3 presents the research design adopted in the study. Section 4 provides a descriptive analysis and content analysis of the literature. Section 5 then synthesises the implications and opportunities afforded by our mapping for future research.

2. Theoretical framework

2.1. Online communities

The notion of "community" is complex and conceptually difficult to define. The term is polysemous and has, over time, been given a range of definitions. One of the first scholars to theorise on it was the sociologist Ferdinand Tönnies. Given the rapid societal evolution and social changes of the 19th century, he sought to differentiate between the terms "society" and "community". In 1887, he defined a community as a *collective based on geographical and emotional proximity*, involving direct, concrete, authentic interactions between members (Tönnies, 2010). Over the last two centuries, the concept has evolved further and been adapted to reflect subsequent changes in society (Proulx & Latzko-Toth, 2000). The notions of collective emotional closeness and authentic interactions amongst members have endured within contemporary definitions of community, but the importance of geographic proximity and direct communication has gradually declined (Dahlander & Frederiksen, 2012; Wellman & Leighton, 1979).

Since the end of the 20th century, another disruptive phenomenon has affected conceptualisations of community: the onset and expansion of virtual life. With the rapid development of digital communications, it is now possible to observe direct interactions between individuals who have no need for geographic proximity. The Internet has enabled the creation of "virtual communities", offering the possibility for individuals who share emotional proximity to interact with each other from distant parts of the world. The writer Howard Rheingold posited the notion of a virtual community for the first time in 1993, defining it as "cultural aggregations that emerge when enough people bump into each other often enough in cyberspace" (Rheingold, 1993, p. 57). Since then, a rapid and widespread proliferation of virtual communities has taken place (Iriberri & Leroy, 2009), with the phrase "online community" taking its place – a neologism that is now anchored in the common vocabulary (Proulx & Latzko-Toth, 2000).

Communities are studied in terms of their goals and their members. Focusing on these two variables, a multitude of different communities arises. To situate online communities within that complex scheme, it is worth noting the most common foci of certain types of community. Communities, when defined by their goals, can include communities of *practice* (Wenger et al., 2002), *epistemic* communities (Bossy & Evrard, 2014, pp. 140–147), communities of *innovation* (Cohendet, Rao, Emilie, Sarazin, & Simon, 2021), communities of *action* and communities of *crisis* (Masson & Parmentier, 2020). Communities, when defined by their participants, include *brand* and *customer* communities (Muniz & O'Guinn, 2001) and *user* communities (Jeppesen & Frederiksen, 2006). This simple typology captures the most widespread and well researched communities in the scientific literatures. However, this list is not exhaustive. The way of life, the functioning, the values, the members, and the objectives of these communities can be impacted by different modalities of existence. An online community is one such modality of existence. It does not exclude physical meetings, but it implies a different type of investment and form of association as a non-geographic, digitalised place. Many communities are currently systematically equipped with a space for exchange and virtual sharing. These communities described above are also impacted by their environments: communities can be *internal* (integrated into a firm), *external* (driven by individuals outside a firm) or *mixed* (the community is deployed both inside *and* outside the firm). It is also possible to categorise communities according to their organisational dynamics, so a community can be hierarchical, with its composition within the company being structured hierarchically, or autonomous, with its coherence based on members' adherence to a common objective, interest or authority (Cohendet et al., 2003).

With these semantic clarifications in mind, "online communities" can be broadly defined as a set of members structured around common interests and interacting on a regular basis within a digital exchange space where they share, create, and meet. An online community is therefore a modality of existence determined by its activity, participants, environment, and organisation (see Fig. 1).

A community can take multiple forms, with its online deployment being only one of its modalities, though this modality has a significant impact on its functioning and performance.

In the context of rapid and comprehensive digitalisation, impacted and exacerbated by health crises such as that of COVID-19, it is plausible to envisage the ongoing and hastened expansion of this type of community. The importance of identifying the key drivers of communities' performance is thus especially topical. Over the last 25 years, the literature has identified numerous drivers of performance, but it is increasingly necessary to develop a comprehensive framework for determining knowledge gaps, and to conduct future research to address these gaps.

2.2. Performance linked to various mechanisms

Given the current technical means widely available on the Internet that require few financial resources to use, creating an online community has become an initiative that is within everyone's reach. After a platform's technical launch, its creator expects it to be efficient. The literature to date identifies *performance* – as per marketing theory – as the ability of an organisation to achieve its objectives by satisfying customers more efficiently and effectively than its competitors (Kotler, 1984). The rationale for adopting specific measures for meeting performance objectives can be internally or externally orientated (Slack, 1991). External objectives focused on enhancing performance seek to drive up sales, increase profits and widen the base of customers. Being more efficient means that the organisation's management of its finances and resources will more effectively achieve customer satisfaction (this comprises a form of internal objective) (Neely, Gregory, & Platts, 1995).

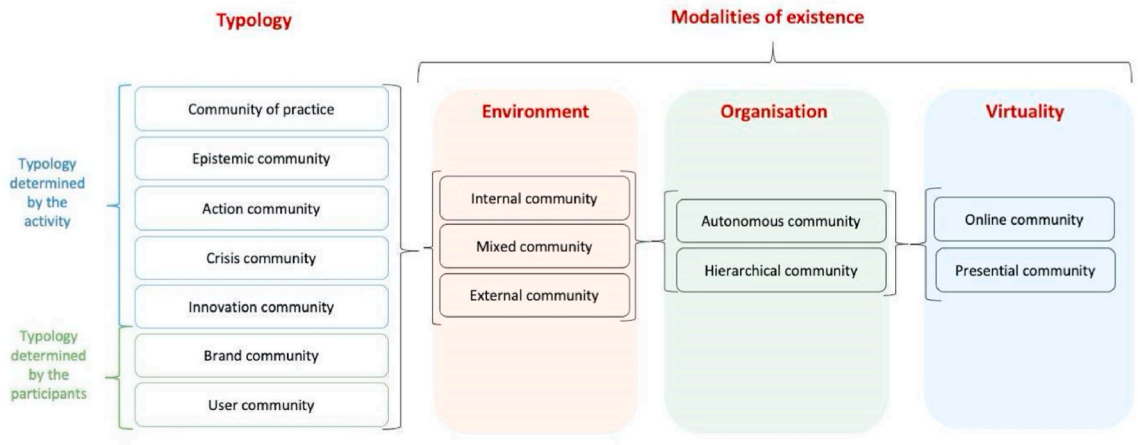


Fig. 1. Typology and modalities of existence of communities.

Research into online communities to date does not precisely define the performance of a community. Some authors speak of performance pertaining to participation (Preece, 2001; Wu et al., 2018), some of the performance of users or organisations (Confente & Kucharska, 2021), and others of the performance of technological tools (Preece, 2001), but no studies have defined the *overall* performance of the community in a way that integrates these various foci.

Applying the concept of performance as conceived by management science to a community, which comprises a form of organisation, leads us to defining the performance of a community as its achievement of objectives through the satisfaction of its participants in the most efficient manner. Three key elements underpin this definition: member satisfaction, efficiency, and the achievement of objectives. A successful community is therefore one that attracts participants who interact with, and contribute to, the achievement of common goals. Since participation in a community is most often free, a community in which participants are not satisfied will almost invariably be inactive or paralysed by conflict.

With online communities being complex social systems in which members interact regularly around common interests, there are certain operating mechanisms that support their development and performance. In this paper, we consider such mechanisms as "the wheelwork or agency by which an effect is produced" (Hernes, 1998, p.78), with "effects" comprising enhanced performance of the community. An identification of key mechanisms will enable us to understand what acts as the wheelwork that produces a desired social outcome, satisfies participants and achieves organisational objectives in an efficient manner.

Several authors have identified mechanisms that affect the development and functioning of the community (Iriberri & Leroy, 2009; Parmentier, 2015; Preece, 2001; Schau, Muñiz, & Arnould, 2009; Young, 2013). Five core mechanisms have this effect on the performance of an online community. The first of these is *motivation*, i.e., the formalisation of the community's objectives and the formal clarification of participants' expectations. Parmentier (2015) points to how the objectification of often tacitly agreed upon goals, values, and rules has a positive effect on the development of a community. The process of objectification constitutes an effort to bring about reflective formality and definition that reinforce the community's purpose, i.e., what encourages members to join the community (Preece, 2001). This mechanism also formalises a clear and structured thread for members which enables them to make contributions accessible and understandable, and allows them to identify a clear common motivation (Parmentier, 2015). The objectification of motivation reinforces the community's identity and attracts new users interested in the community's clearly defined values and goals. This mechanism thus boosts the satisfaction of members by giving meaning to their participation and facilitating the achievement of community objectives by formalising those objectives and orientating action in the community.

Participation is the mechanism that fosters the creation of content, ideas, and knowledge shared by community members. Member participation is necessary for an online community to function properly and allowing members to contribute and collaborate is vital for strong community performance (Amine & Sitz, 2007; Iriberri & Leroy, 2009; Preece, 2001; Young, 2013). An online community is built on voluntary participation (Dahlander & Frederiksen, 2012), and the voluntary nature of their engagement entails that members perceive there to be benefits of participation in the community (Jahan & Kim, 2020). Active community facilitation strengthens online community life and provides opportunities for members to participate in achieving collective goals (Parmentier, 2015). Participation therefore acts to make the achievement of the goals of the community more likely and to boost the satisfaction of its members.

Engagement comprises a mechanism that creates a sense of commitment to helping others in the online community by contributing information, ideas, and knowledge (Wiertz & de Ruyter, 2007). The creation of a strong sense of commitment to the community is essential for involving members in the community's activities. That feeling also transforms new members into active ones, promotes value creation (Schau et al., 2009), and enhances the quantity and quality of contributions (Wiertz & de Ruyter, 2007). These transformations mean members develop a sense of identification with the community (Hammedi, Kandampully, Zhang(Christina), & Bouquiaux, 2015). Engagement therefore acts to boost the effectiveness of the community and promote the achievement of community objectives.

Socialisation comprises the mechanism that fosters the establishment of meaningful relationships and social cohesion between members. Strong socialisation encourages the creation, exchange, and evaluation of content published by members (Parmentier, 2015). The myriad range of social relations within the community foster the development of social capital and the entrenchment of a social identity which in turn enhance the satisfaction of members (Nambisan & Baron, 2010). This process of creating and strengthening relationships is central to strong community performance (Iriberri & Leroy, 2009; Preece, 2001; Young, 2013), and those relationships must be made sustainable over time (Iriberri & Leroy, 2009).

Structuring the online community (referred to here as *structuration*) implies categorising all the actors who interact with the community according to their roles, skills, and contributions. This categorisation of members makes it possible to offer them tools adapted to their motivations and skills, and it stimulates valuable user contributions (Parmentier, 2015). Structuring the community also means establishing clear conduct rules, rituals, moderations, and conflict management

strategies necessary for the community to function properly and smoothly (Amine & Sitz, 2007; Iriberri & Leroy, 2009; Preece, 2001). It therefore directly improves the effectiveness and performance of the community in terms of participant satisfaction and goal formation.

In the remainder of this paper, we identify the drivers that promote the functioning of these five mechanisms, all of which directly affect the performance of online communities.

3. Research design

Research into online communities carried out in management science, sociology and computer science over the past 25 years has identified several factors affecting the proper functioning of communities. Depending on their areas of specialisation, studies to date have focused on just a few conditions, so the literature does not provide a comprehensive map of the conditions and variables affecting online community performance. We therefore conducted a structured, systematic literature review (Paul & Criado, 2020) to identify the core conditions for, and drivers of, an online community's various mechanisms of performance.

For the first stage, we used two databases, Web of Sciences (WoS) and Business Source Complete (EBSCO), to identify and retrieve the sources for our analysis. We conducted a broad search, with all disciplines on WoS scoped in, because the theme of online communities comprises a focus of multiple disciplines (management, sociology, computer science, medicine, etc.). We completed this stage using the EBSCO database. Our literature review focused on online communities' performance factors. We searched for the keywords "online communities" and "performance" in article abstracts to identify articles explicitly focused on the target theme. This method enabled us to identify 238 articles in WoS and 291 in EBSCO, i.e., a total of 529 articles.

For the second stage, we read the titles and abstracts of the 529 articles to determine whether they focused on the *performance* of online communities. We selected articles that explicitly addressed the topic of performance. A simple reference to performance in online communities was not deemed sufficient for the article to be selected. By excluding duplicates, non-refereed journal articles and conference papers, we reduced the final sample to 150 articles.

In the third stage, as the notion of performance has a range of key aspects (achievement of objectives, efficiency, and participant satisfaction), we reopened the literature review based on the citations in the identified articles. The aim here was to find articles that addressed online community performance without the word appearing in the abstract or title. We selected 28 new articles from this process, giving us a final article base of 178 articles. The number of articles pertaining to online community performance has increased significantly in recent years, from 19 articles in the period 2001–2009, to 45 articles in the period 2010–2014, 80 articles in the period 2015–2019 and 34 from 2020 to mid-2020. This growth in article numbers shows that theory and analysis pertaining to online community performance have become increasingly important in recent years. By grouping the 178 articles according to their journals, we identified that our articles came from 114 different journals. The journals most cited (*Journal of Management Information Systems, Computers in Human Behavior, Organization Science,* and *Behaviour & Information Technology*) confirm the strong degree of interest in online community performance in the fields of information systems, management and human behaviour (see in https://vu.fr/yklH).

For the fourth phase, having reviewed all the articles, we coded them to identify the key drivers of performance. These drivers comprise actions, attitudes, or methods that can be put in place within a community to improve its performance. The coding identified the drivers that positively or negatively impact online communities across the five performance mechanisms. As we proceeded through the articles, the list of drivers was refined, and we included only those that are cited in several papers.

At the end of the coding process, we grouped the drivers according to four main thematics according to the aspects of the community they addressed. The thematics related to (i) the digital support of the community, (ii) the organisation of the community, (iii) the participants of the community, or (iv) the contributions to the community. Those four thematics allowed us to propose a structured map that integrates the findings of research across all the disciplines. From our research results, we developed a comprehensive map of the findings from literature over the last 26 years based around five mechanisms, four thematics and 24 drivers relating to the performance of online communities.

4. Conditions for online communities performance

The performance conditions identified in our systematic review are referred to as "performance drivers". Each driver has a positive impact on one or more of the performance mechanisms (see Fig. 2). We calculated the frequency at which they appear in the articles. Categorisation of the drivers revealed key thematics: digital support, organisation, participants, and contributions. Tables 1–4 in the Appendix summarise the thematics, drivers, frequency of appearance and main findings.

4.1. Drivers relating to the digital support of the online community

An online community requires a digital presence formed by a computer environment accessible by its members. The aim here is therefore to identify the main conditions linked to that digital medium that will optimise the functioning of the community.

4.1.1. A powerful technical platform

In the context of the number of online collaborative platforms increasing, their powerful technical functioning is a key element of performance. A platform must be easily accessible by all kinds of users and their personal networks (Ang, 2011). Zablith and al. (2016) claim that an advanced platform also promotes organisational knowledge creation and management. It is also important to ensure the community is technically accessible to any member targeted by the platform's recruitment strategies or wishing to join the group (as in the case of external or mixed communities). Since the technical tool hosts the community, any technical problems with access will damage the credibility of the platform.

The literature has identified key platform characteristics that affect community performance:

According to Rowe (2016), providing a personalised experience to community members (based on their desires and needs) will *prevent disengagement*. Furthermore, Olson and Neal (2015) emphasise the importance of providing a structured application with a search function to easily find information. Platforms often contain a huge volume of diverse and disorganised information so this search function is essential (Olson & Neal, 2015).

Regarding tools for managers, several authors emphasise the importance of providing tools to measure performance in terms of *participation*. Key indicators include frequency of visits, contributions, and member satisfaction (Iriberri & Leroy, 2009; Preece, 2001; Wu et al., 2018). Other authors indicate the value of using automatic content analysis tools to quickly identify new ideas in innovation contexts (Christensen, Nørskov, Frederiksen, & Scholderer, 2017) or health contexts (Jung, Hur, Jung, & Kim, 2015).

The implementation of a powerful technological platform will thus affect three mechanisms of performance: *socialisation* (Ang, 2011), *engagement* (Rowe, 2016) and *participation* (Yen, Huang, 2011).

4.1.2. Strong data protection and privacy policies

With the growth of online platform and social media, the protection of personal data has become an important concern for users. As early as 2005, Leimeister et al. argued for the necessity of assuring user protection, as confirmed by Pan et al. recently (Pan, Wan, Fan, Liu, & Archer, 2017). Reassuring members concerned about the protection of

Thematic	Driver	Mechanism
The digital support	A powerful technical platform	Socialisation
		Engagement
		Participation
	A strong data protection	Participation
		Engagement
	A simple and intuitive navigation	Participation
		Engagement
	Means of interaction	Participation
		Socialisation
		Engagement
	Profile customization	Participation
		Socialisation
		Structuration
	Toolkits	Participation
		Socialisation
The organization	Well-defined objectives and values	Motivation
		Participation
		Structuration
	Established rules and a defined structure	Structuration
	Moderation actions	Participation
		Structuration
	Defined roles and evolving statuses	Structuration
		Participation
		Engagement
	Effective recruitment strategy and good demographics management	Participation
		Engagement
	Community facilitation	Engagement
		Participation
		Socialisation
	Identification of members	Engagement
		Participation
		Structuration
The participants	The development of emotional ties	Socialisation
		Engagement
	The existence of a sense of trust	Participation
		Engagement
	Various benefits and motivations for members	Participation
		Engagement
	Sense of community	Participation
		Engagement
	Reputation of certain members	Structuration
		Participation
		Engagement
	Valuing members	Participation
		Engagement (+/-)
The contributions	Quality and quantity of contributions	Engagement (+/-)
		Participation
		Socialisation
	Gamification	Engagement (+/-)
	Physical events	Socialisation
		Participation
		Engagement
	Competitions	Socialisation
		Participation
	Collaborative work	Engagement
		Socialisation

Fig. 2. Overview of the drivers conducive to the performance of an online community.

Table 1
Distribution of articles on the digital support thematic[a].

The digital support (49%)[b]		
Drivers	Articles	Main findings
Powerful technical platform **(15%)**	(Ang, 2011) (Masson & Parmentier, 2020) (Zablith, Faraj, & Azad, 2016) (Yen et al., 2011) (Liu et al., 2014) (Rowe, 2016) (Christensen, Nørskov, et al., 2017) (Zhao, Cheng, Chen, Xiong, & Cheng, 2020) (Yetis, Larsson et al., 2019) (Olson & Neal, 2015) (Gallus, 2017) (Wang, Yin, et al., 2013) (Colladon, Guardabascio, & Innarella, 2019) (Liu, Wang, Fan, & Zhang, 2020) (Al Qundus, Paschke, Gupta, Alzouby, & Yousef, 2020) (Guo, Peng, & Wang, 2013) (H. Wang, Yin, et al., 2013) (Huh, Yetisgen-Yildiz, & Pratt, 2013) (Jung et al., 2015) (Wright et al., 2009) (Amanatiadis, Mitsinis, & Maditinos, 2015) (Bălău & Utz, 2017) (Chang, Hsu, Hsu, & Cheng, 2014) (Chandna & Salimath, 2020) (Xu, Zhou, & Ma, 2019) (Toral, Martínez-Torres, & Barrero, 2009) (Zhang, Zhou, et al., 2021) (Seo, Bruce Croft, & Smith, 2011)	Digital support is critical for an online community. The implementation of drivers relating to digital support has a major impact on the **participation** of community members. *A powerful technical platform*, the *means of interaction* and *profile customisation* are the most important drivers of online community performance.
Strong data protection **(3%)**	(Iriberri & Leroy, 2009) (Pan et al., 2017) (Tsikerdekis, 2017) (Samanta, Zhou, & Sundaram, 2015) (Asim et al., 2020)	
Simple and intuitive navigation **(3%)**	(Iriberri & Leroy, 2009) (Preece, 2001) (Hutter et al., 2016) (Faraj et al., 2011) (Amanatiadis et al., 2015) (Hsu & Liao, 2019)	
Means of interaction **(23%)**	(Iriberri & Leroy, 2009) (Hutter et al., 2016) (Jahan & Kim, 2020) (Nepal et al., 2015) (Levine & Prietula, 2014) (Kumi & Sabherwal, 2018) (Wiertz & de Ruyter, 2007) (Bateman, Gray, & Butler, 2011) (Panteli & Sivunen, 2019) (Shiue, Chiu, & Chang, 2010) (Abbasimehr & Tarokh, 2015) (Lin, Mai, & Lai, 2015) (J. Wu et al., 2018) (Dissanayake, Nerur, Wang, Yasar, & Zhang, 2021) (Kudaravalli & Faraj, 2008) (Baek & Kim, 2015) (Baker & Bulkley, 2014) (Chadha, 2018) (Park & Park, 2016) (Liu et al., 2020) (Kozlenkova et al., 2017) (N. Wang, Yin, Ma, & Liao, 2021) (Cao et al., 2015) (Pan et al., 2015) (Qiao, Shan, Zhang, & Liu, 2019) (Nguyen et al., 2019) (Wright et al., 2009) (Bălău & Utz, 2017) (Zhang, Liu, & Chen, 2017) (Liu & Li, 2017) (Wang, Yin, et al., 2013) (Yilmaz, 2016) (Lenart-Gansiniec, 2017) (Jeong et al., 2021) (X. Liu et al., 2020) (Chandna & Salimath, 2020) (Gallus, 2017) (Hollebeek et al., 2017) (J. Yang et al., 2017) (Moser & Eijkeren, 2016) (Chih-Hung, Hung-Wei, Rong-Mu, & Pham Duc, 2019) (Steinhoff, Arli, Weaven, & Kozlenkova, 2019) (Guo et al., 2015)	
Profile customisation **(3%)**	(Iriberri & Leroy, 2009) (Mercanti-Guérin, 2010) (Nepal et al., 2015) (Park & Park, 2016) (Maltby, Thornham, & Bennett, 2018)	
Toolkit **(3%)**	(Parmentier & Gandia, 2013) (Hammedi et al., 2015) (Levine & Prietula, 2014) (Park & Park, 2016) (Lang, Shang, & Vragov, 2015)	

[a] All references: https://vu.fr/yklH.
[b] Percentage of articles relating to this thematic in the final base of 178 articles.

their data will have the effect of increasing community cohesion and levels of *participation* in the community (*ibid*). If members feel reassured and can see that the platform respects their privacy, they are likely to develop trust in the platform and the community. According to Gharib, Philpott, and Duan (2017), the presence of trust drives more affective *engagement*. Therefore, this driver will have a positive effect on the mechanisms of *participation* and *engagement*.

4.1.3. Simple and intuitive navigation

The graphic design and ergonomics of the site or application hosting the community are key elements that are important to performance for various reasons. Paying careful attention to the graphic interface of the platform enhances access to the community for individuals who are less comfortable with using digital technologies. Faraj et al. (2011) argue that fluidity is also necessary for making knowledge collaboration possible in online communities. We posit that a simple application, enabling members to quickly understand the various functionalities and the nature of member collaboration, encourages *participation* mechanism.

Regarding ergonomics, Preece et al. (2001) have recommend developing simple and intuitive navigation for members (Preece et al., 2001; Iriberri & Leroy, 2009). This makes it easier for members to access the information they need and to understand the tools and features of the platform. Ease of navigation is important so as not to detract from members' sense of commitment to the community (Hutter, Nketia, & Füller, 2017). This driver therefore has a positive impact on *engagement* with the community.

4.1.4. Means of interaction

Interaction between members comprises the main user activity within communities (Liang, Ow, & Wang, 2020) and this driver is among the most frequently identified in the literature review. The literature indicates that the implementation of interaction tools is a major driver of the performance of an online community. The right means of interaction enables dialogue and reciprocity of exchange between members and therefore, impacts the *socialisation* mechanism.

The establishment of dialogue spaces (e.g., private messaging facilities, public threads) enables members to exchange communication and ideas with each other and promotes the sharing and production of new knowledge (Park & Park, 2016; Wiertz & de Ruyter, 2007). A dialogue space allows synchronous exchanges (instant, such as chats) and asynchronous exchanges (time-lagged, such as in a forum). These exchanges

Table 2
Distribution of articles on organisation thematic[a].

The organization (47%)[b]		
Drivers	Articles	Main findings
Well-defined objectives and values **(5%)**	(Young, 2013) (Amin & Roberts, 2008) (T. Zhang et al., 2018) (Ling et al., 2005) (Fisher, 2019) (Burke, Kraut, & Joyce, 2010) (von Wallpach, Hemetsberger, & Espersen, 2017) (Jeong et al., 2021) (S. Chou, 2010)	Organisational drivers particularly influence **structuration** and **participation**. Clarifying the role of each person (including managers and participants) and their objectives in the community is critical to effective structuration. Providing the opportunity to identify members (by activity or expertise) allows for rewarding of active members (**engagement**) and helps to identity expertise required (**structuration**).
Established rules and a defined structure **(3%)**	(Iriberri & Leroy, 2009) (Preece, 2001) (Yen et al., 2011) (Hutchinson, 2015) (Mühlhaus, Weiber, Kim, & Hyun, 2012) (Yeshua-Katz, 2015)	
Moderation actions **(8%)**	(Young, 2013) (Raïes & Gavard-Perret, 2011) (J. Chen et al., 2011) (Nepomuceno et al., 2020) (Li-Ying et al., 2018) (Lin et al., 2015) (Tsikerdekis & Zeadally, 2014) (Zhang, Zhou, et al., 2021) (Asim et al., 2020) (Becker et al., 2021) (Otto & Simon, 2008) (Bullard & Howison, 2015) (L. Zhou, Sung, & Zhang, 2013) (Pavlou & Gefen, 2005) (Yeshua-Katz, 2015)	
Defined roles and evolving statuses **(6%)**	(Gosselin et al., 2010) (Amine & Sitz, 2007) (Chou et al., 2015) (Wilkin, Campbell, Moore, & Simpson, 2018) (Y. Zhou & Chen, 2019) (Mutter & Kundisch, 2014) (Y. Zhang & van der Schaar, 2013) (Qiao et al., 2019) (Dong et al., 2020) (Havakhor, Soror, & Sabherwal, 2018)	
Effective recruitment strategy and good demographics management **(9%)**	(Ang, 2011) (Mercanti-Guérin, 2010) (Young, 2013) (Kozinets et al., 2010) (Parmentier, 2015) (C. Chou et al., 2015) (Liang et al., 2020) (Nepomuceno et al., 2020) (Wang, Yin, et al., 2013) (Olson & Neal, 2015) (Pescetelli, Rutherford, & Rahwan, 2021) (Kim et al., 2016) (Qiu & Kumar, 2017) (Seidel & Langner, 2015) (Bullard & Howison, 2015) (Ray, Kim, & Morris, 2014)	
Community facilitation **(4%)**	(Young, 2013) (Raïes & Gavard-Perret, 2011) (Amine & Sitz, 2007) (Parmentier, 2015) (Chen et al., 2012) (Gálvez-Rodríguez, del, Haro-de-Rosario, & Caba-Pérez, 2018) (Silvio, 2010)	
Identification of members **(12%)**	(Iriberri & Leroy, 2009) (Mercanti-Guérin, 2010) (Dahlander & Frederiksen, 2012) (Liu et al., 2014) (Abbasimehr & Tarokh, 2015) (Wilkin et al., 2018) (Baek & Kim, 2015) (Rowe, 2016) (Zhao et al., 2020) (G. A. Wang, Yin, et al., 2013) (Colladon et al., 2019) (J. Wang, Luo, Hao, Ding, & Zhang, 2019) (Pescetelli et al., 2021) (Al-Taie et al., 2018) (Füller et al., 2008) (Wright et al., 2009) (Hong, He, Ge, Wang, & Wu, 2017) (Otto & Simon, 2008) (Barcellini, Détienne, & Burkhardt, 2014) (Debaere et al., 2018) (Dissanayake, Zhang, & Gu, 2015) (Bhattacharyya et al., 2020) (Schneider, Von Krogh, & JäGer, 2013)	

[a] All references: https://vu.fr/yklH.
[b] Percentage of articles relating to this thematic in the final base of 178 articles.

help to strengthen the sense of identification with the community (Panteli & Sivunen, 2019) and encourage collaboration within the community (Guo, Pathak, & Cheng, 2015; Kumi & Sabherwal, 2018). These spaces permit members to interact between them, impacting the *participation* mechanism.

Encouraging reciprocal interactions is particularly important online where, unlike in face-to-face settings, it is difficult to immediately identify the attention of those whom you are communicating with. Reacting and commenting on a member's publications has the effect of enhancing a sense of reciprocity. If reciprocity is perceived as high, this also will have a positive effect on *participation* and knowledge sharing (Haas, Abonneau, Borzillo, & Guillaume, 2021; Iriberri & Leroy, 2009; Jahan & Kim, 2020). Hutter et al. add that exchanges between community members have a positive effect on *engagement* (Hutter et al., 2017).

4.1.5. Profile customisation

According to Park and Park (2016), transparency of identities within online communities significantly improves community effectiveness, positively impacting *participation*. Therefore, it is important to provide users with profile personalisation tools. Giving members the option to choose a profile image has a positive impact: they appreciate the ability to define and recognise themselves through images or photos (Iriberri & Leroy, 2009). Similarly, the addition of a presentation space in personal profile sections allows for the implementation of recommendation systems to encourage association between members who share similar interests or common friends. This facilitates the promotion of meetings and the creation of affective connections between users and with the community (Mercanti-Guérin, 2010; Nepal et al., 2015). It will therefore positively impact *socialisation* and *structuration* mechanisms.

In some online communities, the ability of members to anonymise themselves may be relevant to freeing up dialogue. This is particularly the case in action communities dealing with controversial or personal issues (e.g., those pertaining to religion, politics, or personal health). Anonymity can thus, in some contexts, have a positive effect on participation, though enabling this option can create conflict between users by facilitating inappropriate or intrusive behaviour.

4.1.6. Toolkits

Digital toolkits provide users with tools for customising or creating products (Parmentier & Gandia, 2013). They are often set up to encourage creativity and innovation within online communities. These toolkits enable collaboration among members, helping to foster relationships and exchanges that boost members' commitment to the community (Hammedi et al., 2015). The provision of customisation and co-creation tools has a strong effect on the quantity and variety of

Table 3
Distribution of articles on participant thematic[a].

The participant (57%)[b]		
Drivers	Articles	Main findings
The development of emotional ties **(10%)**	(Iriberri & Leroy, 2009) (Raïes & Gavard-Perret, 2011) (Huysman & Wulf, 2004) (Gharib et al., 2017) (Nepal et al., 2015) (Abbasimehr & Tarokh, 2015) (Chuang, 2020) (Kim et al., 2019) (Wang et al., 2020) (Sun, Williams, & Li, 2021) (Zhang, Zhou, et al., 2021) (Xing Zhang, Liu, & Chen, 2017) (Kumi & Sabherwal, 2018) (Chandna & Salimath, 2020) (Jeong et al., 2021) (Kozlenkova et al., 2017) (Y. Zhang, Lu, & Zheng, 2020) (Dutot & Mosconi, 2016)	It is important that the member can create a place for themselves as an individual within the community, based on relationships, valuations, trust, benefits, etc. These drivers primarily affect the **engagement** and **participation** of members within the community.
Existence of a sense of trust **(7%)**	(Iriberri & Leroy, 2009) (Gharib et al., 2017) (Leimeister et al., 2005) (Akrout & Cathalo, 2015) (Pan et al., 2017) (Zhang et al., 2018) (Abbasimehr & Tarokh, 2015) (Wohlgemuth, Berger, & Wenzel, 2016) (Zhang, Zhou, et al., 2021) (Füller et al., 2008) (Cao et al., 2015) (Jeong et al., 2021)	The driver concerning the *reputation* of certain members is particularly important: having "sub-leaders" impacts **structuration**, **participation**, and **engagement**.
Various benefits and motivations **(18%)**	(Akrout & Cathalo, 2015) (Füller et al., 2006) (Wiertz & de Ruyter, 2007) (Yen et al., 2011) (Cheng & Vassileva, 2006) (Bateman et al., 2011) (Y. Zhou & Chen, 2019) (Wu et al., 2018) (Mühlhaus et al., 2012) (Ye & Nov, 2013) (Wang & Clay, 2012) (Gallus, 2017) (Baker & Bulkley, 2014) (Chang et al., 2020) (Ren et al., 2010) (Zhang, Wang, Lin, & Tai, 2015) (N. Wang et al., 2021) (Moqri, Mei, Qiu, & Bandyopadhyay, 2018) (Mutter & Kundisch, 2014) (Dong et al., 2020) (Sousa-Vieira et al., 2020) (Nguyen et al., 2019) (Zhang, Liu, & Chen, 2017) (Wang, Zhang, Hao, & Chen, 2019) (Cappa & Laut, n.d.) (H. Liu & Li, 2017) (Xing Zhang, Liu, & Chen, 2017) (Chandna & Salimath, 2020) (Dobreva, 2019) (Xie & Jia, 2016) (Lim & Schumann, 2019) (H. Chen et al., 2019)	
Sense of community **(8%)**	(Nepal et al., 2015) (T. Zhang et al., 2018) (Abbasimehr & Tarokh, 2015) (Zhang, Zhou, et al., 2021) (Chang et al., 2020) (Chiu et al., 2015) (Füller et al., 2008) (Cao et al., 2015) (Yilmaz, 2016) (von Wallpach et al., 2017) (Chandna & Salimath, 2020) (Hollebeek et al., 2017) (D. Wang, Li, Xu, & Wu, 2017) (Confente & Kucharska, 2021) (Jeong et al., 2021)	
Reputation of the members **(7%)**	(Cheng & Vassileva, 2006) (J. Chen et al., 2011) (Panteli & Sivunen, 2019) (Rehm et al., 2016) (Baker & Bulkley, 2014) (Ren et al., 2010) (Geng, Wang, Chen, Song, & Yu, 2020) (Havakhor et al., 2018) (Oh et al., 2016) (Yang et al., 2021) (Cai & Zhu, 2016) (Wu & Lu, 2016)	
Valuing members **(7%)**	(Ling et al., 2005) (Bhattacharyya et al., 2020) (Mutter & Kundisch, 2014) (Becker et al., 2021) (Chiu et al., 2015) (Qiu & Kumar, 2017) (Cappa & Laut, n. d.) (Cai & Zhu, 2016) (DeVaro, Kim, Wagman, & Wolff, 2018) (Riedl et al., 2013) (Dutot & Mosconi, 2016) (Song, Yan, & Li, 2015)	

[a] All references: https://vu.fr/yklH.
[b] Percentage of articles relating to this thematic in the final base of 178 articles.

products created (Park & Park, 2016), attracting new members and encouraging existing members to *participate* more (Parmentier & Gandia, 2013).

The implementation of toolkits is thus a key driver encouraging participation and, since toolkits promote collaboration, they also have a positive impact on *socialisation*.

4.2. Drivers relating to the organisation of online communities

An online community is a type of organisation, and, like all organisations, they need goals, standardised rules of operation, clearly defined member roles, and organised events to function effectively.

4.2.1. Well-defined objectives and values

An online community is a space in which individuals share a common interest and find each other through their pursuit of shared values and goals. This driver, by definition, enhances *motivation* mechanism. Shared values are one of the three components of social capital accumulation, which is essential for ongoing interaction and exchange between and among members (Jeong, Ha, & Lee, 2021). Young (2013) calls this common grounding whereby members share values and a common interest "the domain". The domain is defined by "whom the community is for and why", and it is one of the core elements of a successful online community. It encourages increased *participation* among members. Clarifying the purpose, goals and motivations of the community and members' participation in it fosters the generation of new knowledge (Amin & Roberts, 2008), particularly when goals are attributed to a group rather than to individual members (Ling et al., 2005). The clear determination of common objectives and values will help platforms determine which tools and management strategies are pertinent and valued by the community (Young, 2013). This clarity of purpose thus supports *structuration* mechanism.

4.2.2. Established rules and a defined structure

Online communities most often apply a horizontal mode of governance (Hutchinson, 2015). This mode of governance requires a certain structure being applied and adhered to within the community. Upon arrival, a new member should be able to access the group's structuring rules, including codes, protocols, objectives, cooperation norms, what can and what cannot be done on the site or application, communication methods and acceptable modes of behaviour. A lack of such structural controls can harm the attractiveness, credibility, quality, and quantity of members' contributions to the community (Otto & Simon, 2008; Yen,

Table 4
Distribution of articles on the contribution thematic[a].

The contribution (36%)[b]		
Drivers	Drivers	Drivers
Quality and quantity of contributions **(22%)**	(Ang, 2011) (Dahlander & Frederiksen, 2012) (Wiertz & de Ruyter, 2007) (Christensen, Nørskov, et al., 2017) (Liu et al., 2014) (Cheng & Vassileva, 2006) (J. Chen et al., 2011) (Chou et al., 2015) (Ling et al., 2005) (Wilkin et al., 2018) (Lin et al., 2015) (Baek & Kim, 2015) (Christensen, Nørskov, et al., 2017) (Ye & Nov 2013) (Park & Park, 2016) (Wang, Yin, et al., 2013) (Wang et al., 2020) (Zhang et al., 2015) (X. Liu et al., 2021) (Al Qundus et al., 2020) (Jung et al., 2015) (Füller et al., 2008) (Dong et al., 2020) (Sousa-Vieira et al., 2020) (Wang, Zhang, et al., 2019) (Chen et al., 2012) (Qiu & Kumar, 2017) (H. Liu & Li, 2017) (Debaere et al., 2018) (Oh et al., 2016) (DeVaro et al., 2018) (Riedl et al., 2013) (Bullard & Howison, 2015) (Liu et al., 2020) (Xie & Jia, 2016) (Chen et al., 2019) (Schau et al., 2009) (Moser & Eijkeren, 2016) (Haas et al., 2021) (Ray et al., 2014)	This thematic mostly affects **socialisation** and **engagement**. The quality, quantity and continuity of contributions are affected by the *motivations* of members. This important driver has a variable impact on **engagement**. *Physical events* are another important driver, impacting **participation**, **socialisation**, and **engagement**.
Gamification **(2%)**	(Rapp, 2018) (Leclercq et al., 2020) (Sousa-Vieira et al., 2020)	
Physical events **(3%)**	(Parmentier & Mangematin, 2014) (Schau et al., 2009) (Bliuc et al., 2020) (M. Kim et al., 2019) (Grabher & Ibert, 2014) (Schott, Grinberger, Lautenbach, & Zipf, 2021)	
Competitions **(4%)**	(Mercanti-Guérin, 2010) (Schau et al., 2009) (Wiertz & de Ruyter, 2007) (Dissanayake et al., 2021) (Wang, Yin, et al., 2013) (DeVaro et al., 2018) (Riedl et al., 2013) (Dissanayake et al., 2015) (Villarroel, Taylor, & Tucci, 2013)	
Collaborative work **(6%)**	(Ling et al., 2005) (X. Zhang, Lu, & Zheng, 2020) (Ren et al., 2010) (Zhang et al., 2015) (Zhang & van der Schaar, 2013) (Wang & Sun, 2021) (Wang, Zhang, et al., 2019) (Chen et al., 2012) (Oh et al., 2016) (Yan et al., 2021)	

[a] All references: https://vu.fr/yklH.
[b] Percentage of articles relating to this thematic in the final base of 178 articles.

Hsu, & Huang, 2011). Thus, the driver as an impact on *structuration* mechanism. Rules may vary in their degree of formality, depending on the maturity of the community, but it is particularly important that they be applied and monitored during the community's initial stages of development (Iriberri & Leroy, 2009). They can, of course, be asserted in the community in a tacit way. According to Preece, tacit assumptions, rituals, protocols, rules, and laws all define the community's identity (Iriberri & Leroy, 2009; Preece, 2001). These rules can also concern the intellectual property of content production, particularly within internal communities in which the company must be transparent about its use of content created by members.

4.2.3. Moderation actions

In contemporary online communities, problems of identity fraud, identity deception or inappropriate interventions and comments are increasingly common (Tsikerdekis & Zeadally, 2014). These issues can compromise community security and impact members' private lives (Asim, Malik, Raza, Naeem, & Rathore, 2020). Establishing a climate of control fosters a feeling of trust towards the community and is beneficial to the creation and strengthening of bonds and interactions between members (Zhang, Zhou, Zhan, & Zhou, 2021). The implementation of frequent moderation actions also promotes knowledge sharing and enhances the quality of contributions (Chen, Xu, & Whinston, 2011; Li-Ying, Zhang, & Long, 2018). This driver therefore affects *participation* mechanism. Moderation can be the task of the community manager who also facilitates actions or can be shared across community members (Young, 2013). Determining who can moderate the community will affect and interrelate with structuration. Moderation also plays an important role in supporting new users in discovering how the community works (*Ibid*). In some communities, members can flag up content that seems inappropriate, helping the moderator to identify contributions that do not conform to established rules. The presence of moderator members promotes the effectiveness of the *structuring* mechanism within the online community.

4.2.4. Defined roles and evolving statuses

The various roles of community members and managers are mapped out depending on specific actions and responsibilities. The community initiator establishes the community's foundations (Gosselin et al., 2010), and then the community manager enacts facilitating actions adapted to the community's evolution. When a community grows, it can ultimately end up managing and facilitating itself, blurring the nature of role definition (Amine & Sitz, 2007; Gosselin et al., 2010). The community moderator (sometimes assisted by certain members) verifies that published content and interactions comply with the community's rules. Community members bring the community to life, but their degrees of participation (as leaders, followers, or "lurkers"), loyalty, seniority, and commitment to the community and its members vary greatly. Technicians are responsible for the virtual environment and are necessary for the functioning of an online community (*Ibid.*). Identifying these members thus facilitates the community's *structuration*.

It can be valuable to offer members the opportunity to grow and develop their statuses via community involvement. This brings them recognition by peers and encourages them to remain active within the community (Dong, Huang, Hou(Jove), & Liu, 2020), impacting *participation* mechanism. On the other hand, when a member loses rank or status within the community, they become prone to exhibiting disengagement behaviours (Mutter & Kundisch, 2014). This driver can therefore impact *engagement* mechanism.

4.2.5. Effective recruitment strategies and good demographics management

Many online communities fail to grow because they do not attract enough members or create enough value (Wang, Yin, Yao, & Liu, 2013). To acquire more members in the community, it is often necessary to establish recruitment measures (Young, 2013). Having more members in a community fosters increased activity, so this driver has an impact on *participation* mechanism. Wang, Chan, and Yang (2013) found that as an online community grows in age and size it encounters more difficulty in attracting new members. Recruitment can be encouraged in several ways. The company network can be utilised in the case of internal or mixed communities, and personal or professional networks can be exploited via various communication actions (e.g., print or digital communication strategies) (Ang, 2011). In the case of brand communities, recruitment can be enacted by word of mouth by the company itself, exercising intentional influence through marketing companies

and encouraging communication between consumers (Kozinets, de Valck, Wojnicki, & Wilner, 2010). When implementing these strategies, communities seek to highlight the perceived values and benefits offered to anyone who joins. Relying on the community's visual identity and clearly articulating its values and objectives also strengthen this process.

The size of the community must, however, be carefully monitored. If it becomes very large, members can become detached from each other and from the community (Mercanti-Guérin, 2010). A smaller community promotes increased member loyalty and commitment (Nepomuceno, Visconti, & Cenesizoglu, 2020; Scarpi, 2010). This driver thus has variable impact on *engagement* mechanism. Larger communities are exposed to other risks, in that they attract more trolls and trolling activity (Nepomuceno et al., 2020), and they need to be restructured into thematic "islands" or sub-communities so that members can gather around specific interests (Olson & Neal, 2015).

4.2.6. Community facilitation

Measures to facilitate the online community are taken by a community manager, who works to make the community more active and interesting for members (Young, 2013). Member interest can be maintained by encouraging users to log in regularly to discover new publications (Parmentier, 2015). Facilitation efforts evolve according to the maturity of the community (Amine & Sitz, 2007; Young, 2013) and the seniority of its members – it becomes necessary to arouse the interest of newcomers as a community develops and grows (Raïes & Gavard-Perret, 2011). Newcomers must be encouraged to engage with the community and transform into active members of the group (Young, 2013). This driver has a high impact on *engagement* mechanism. In the case of online communities driven by sponsor companies, the companies must demonstrate a proactiveness and responsiveness towards members' contributions to encourage a large volume of high quality contributions (Chen, Marsden, & Zhang, 2012), thus affecting *participation* mechanism. Facilitation actions within a community can vary significantly in nature (e.g., challenges, competitions, events, or rituals), but the key objective behind them is always to involve members and encourage their contributions, both individual and collective. This is discussed in more detail in the section on the mechanism of contribution. This driver therefore has an impact on *socialisation* mechanism.

4.2.7. Identification of members

The members of a community correspond to a certain typology. It is possible to differentiate between two spaces in which members gravitate: the *core* and the *periphery* (Dahlander & Frederiksen, 2012). The members of the core, also called *lead users* or *leaders*, are those who produce the majority of contributions (*ibid*, von Hippel, 1986). This group is relatively stable and entry into the group is rarer than entry into the periphery (Mercanti-Guérin, 2010). Between those two spaces, *followers* appear who do not contribute significantly but are nevertheless invested in the community's news. On the periphery, there are *lurkers*, who never contribute to the community and are content to watch community interactions from afar (Iriberri & Leroy, 2009). Rowe (2016) adds to this typology the *churners*, who are members who stop interacting with the community after joining but are sometimes invested in it. Developing a typology of members within a community enables churners to be identified and churner disengagement can be reduced or prevented. This proves less costly than initiating new recruitment measures (Rowe, 2016). Generating a typology of members thus supports *engagement* mechanism. It also helps with identifying leaders and encouraging them to contribute and participate in the community, sustaining both the quality and the quantity of their contributions. This therefore has a positive knock-on effect on *participation* mechanism.

A second form of identification that does not merely measure member activity focuses on member *expertise*. Identifying people competent in a specific domain enables community actors to capitalise on each other's expertise according to the community's needs. This fosters knowledge production and management (Al-Taie, Kadry, & Obasa, 2018; Liu, Wang, Johri, Zhou, & Fan, 2014; Wang, Yin, et al., 2013) in a structured environment tailored to members, thus impacting *structuration* mechanism.

4.3. Drivers relating to online community participants

When an online community environment is satisfactory for members (due to its quality digital support mechanisms and organisation), a series of new drivers, less quantifiable and more linked to participants and their relationships, serves to shape and support the social dynamics of the online community.

4.3.1. The development of emotional ties

Being part of an online community can give rise to the formation of strong relationships between members, often to the extent that affective and emotional ties are established within the community. This driver significantly affects *socialisation* mechanism. Huysman and Wulf (2004, p.53) highlights this effect when defining online communities as being characterised by "individuals who have developed feelings of belonging and attachment to each other". For companies, strengthening relationships within a brand or innovation community (i.e., between members and between members and the structure) will, over time, have a positive impact on sales figures (Kozlenkova, Palmatier, Fang, Xiao, & Huang, 2017). On the other hand, neglecting this emotional aspect can prompt the disengagement of members (Dutot & Mosconi, 2016), so this driver has a clear effect on *engagement* mechanism. To encourage socialising among and between members, members need to be given the appropriate exchange tools and the community needs to be properly facilitated or its self-facilitation must be embedded (e.g., through discussions, projects, events and co-creations). This is particularly important during the initial growth stage of online communities. It is only with time that some members move from engaging in rational and calculative relationships with the community to partaking in socio-emotionally meaningful relationships (Raïes & Gavard-Perret, 2011). This highly affective engagement within the community has a positive impact on behavioural engagement (Chuang, 2020) and boosts members' commitment to the community (Gharib et al., 2017).

4.3.2. The existence of a sense of trust

Feelings of trust – between community members and of the community itself – are a critical characteristic of an effective community (Wenger, McDermott, & Snyder, 2002). To foster a culture of trust within an online community, Leimeister, Ebner, and Krcmar (2005) state that certain measures must be implemented, such as the integration of different levels of anonymity. If the community manager maintains closeness with the members and engages in exchanges with them regularly, close relationships will often ensue that entrench a climate of trust conducive to further dialogue (Akrout & Cathalo, 2015). Working to boost cohesion around common and shared values also has a positive impact on the emergence of a general feeling of trust (Zhang, Bilgihan, Kandampully, & Lu, 2018).

Trust in a brand or community is vital in encouraging members to share their knowledge and generate new ideas (Füller, Matzler, & Hoppe, 2008), thus demonstrating trust's impacts on *participation* mechanism. It also helps to increase social capital (Cao, Guo, Liu, & Gu, 2015) and impacts members' affective commitment to the community (Gharib et al., 2017). This driver also impacts *engagement* mechanism. The identification of trusted members within the community serves to promote meetings between them, contributes to increased social interactions, and strengthens the trust network (Abbasimehr & Tarokh, 2015).

4.3.3. Various benefits and motivations for members

Members need to accrue benefits from their participation in the community for an online community to sustain itself and grow. *Intrinsic* benefits relating to pleasure, interest, satisfaction, curiosity, self-

expression, challenges, and hedonic motivations affect the *quantity* of contributions. *Extrinsic* benefits, relating to the search for a sense of reward, affect the *quality* of contributions and promote identification with the community (Baker & Bulkley, 2014; Chang, Hou, Wang, Cui, & Zhang, 2020; Füller, Bartl, Ernst, & Mühlbacher, 2006). These rewards have a regulating effect on the quantity, quality, and sustainability of members' *participation* in the community (Cheng & Vassileva, 2006). In online communities, involvement is often linked to perceived personal benefits, such as the acquisition of information or the obtainment of popularity (Wiertz & de Ruyter, 2007). The benefits sought and obtained by members vary greatly depending on the type of community. Some communities may, for example, offer members financial benefits. Füller et al. (2006) claim that more focus should be placed on intrinsic benefits, whereas Akrout and Cathalo (2015), unconvinced of the value of those benefits over the long term, recommend an alternation of economic rewards and entertainment. Serious attention should be paid to rewards, even symbolic ones, because they have a positive effect on new members' *engagement* with the community (Gallus, 2017). Members' individual characteristics, cultural backgrounds and professions can all moderate motivations and benefits (Nguyen, Nham, Froese, & Malik, 2019). Tailoring rewards according to these personal, cultural, and professional characteristics and the circumstantial needs of the community will enhance the quality of contributions (Cheng & Vassileva, 2006). This driver therefore has a major impact on *participation* and engagement mechanisms.

4.3.4. Sense of community

The emergence of online communities has enabled users from all over the world to come together to express and exchange shared values, ideas, and passions. This feeling of belonging and attachment to the community is referred to as a "sense of community" and is a central pillar of online communities (Huysman & Wulf, 2004, p.53). Encouraging this collective feeling within the community is beneficial to the community's ongoing development, as members will tend to have a stronger desire to encourage their peers (Chandna & Salimath, 2020). Commitment to, and trust of, a brand will also be reinforced, and member participation in the community will be positively impacted, when such a sense of collectiveness is prevalent in a community (Zhang et al., 2018, 2021). Fostering extrinsic motivations and citizenship behaviours by encouraging positive interactions between members promotes strong identification with the community (Chang et al., 2020; Chiu, Huang, Cheng, & Sun, 2015; Hollebeek, Juric, & Tang, 2017). This driver thus has a strong impact on *participation* and *engagement* mechanisms.

4.3.5. Reputation of certain members

Within some communities, reputation can act as a mechanism that highlights specific members, and this can promote social and intellectual communication within the community (Rehm, Mulder, Gijselaers, & Segers, 2016). In some contexts, the community itself is built around an influencer, with this leadership fostering identification with the community among members. As it grows, that structured governance pattern can reproduce itself but also iteratively change, with some members taking on 'sub-leader' roles (Panteli & Sivunen, 2019). Reputation thus impacts *structuration* mechanism. The exchanges between a leader and the members of a community can be homogenous (with this form of relationship being especially effective in emerging communities that are still not very centralised around a sense of community) or differential (contributing to member engagement). Those two behaviours complement each other and must be adapted to suit the maturity of the community and optimally affect the *participation* and *engagement* of members (Oh, Moon, Hahn, & Kim, 2016). During collaborative projects, it is not uncommon for teams to be composed of members with varied reputations, and this eclecticism drives value creation, increased diversity, and performance within the group (Yang, Yan, Jia, & Liang, 2021). In addition to the *structuration* mechanism, this therefore impacts *participation* and *engagement*.

4.3.6. Valuing members

It is possible to establish mechanisms within a community for evaluating members' individual contributions. These can take several forms depending on the nature of the community (examples include systems of "likes", badges, scales of idea evaluation, etc.). Highlighting the uniqueness of members has a favourable impact on future contributions (Ling et al., 2005), increasing the quality of contributions rather than the quantity of contributions (Becker, Coussement, Büttgen, & Weber, 2021). This driver therefore has an impact on *participation* mechanism. Actions that show recognition of members are particularly important (Bhattacharyya, Banerjee, Bose, & Kankanhalli, 2020) because failing to demonstrate the value of deserving members and their contributions can negatively impact future participation and commitment (Ibid; Dutot & Mosconi, 2016). The driver therefore also affects *engagement* mechanism.

4.4. Drivers of contributions to online communities

Members' contributions feed directly into community dynamism and the achievement of community objectives. Certain drivers encourage this flow of contributions.

4.4.1. Quality and quantity of contributions

Some communities have a central objective of creating value, including goals orientated to financial gain, product improvement, the generation of innovative ideas, or the creation of content or services. Companies sometimes use online communities to develop new products and improve their performance and reputation by directly engaging with users (Bullard & Howison, 2015; Chou, Yang, & Jhan, 2015). The most common forms of contribution comprise the posting of information, the submission of ideas, the posting of comments and the evaluation of other members' ideas (Bayus, 2013). Idea development can have a negative impact on an individual's loyalty to the community. If members do not receive valued feedback from other members, they may feel excluded from the group and this will deleteriously affect their *engagement*. In contrast, commenting and evaluating can have a positive impact on the generation of future ideas (*Ibid*), and thus on *participation*. Idea generation is often on a huge scale within online communities, so to identify quality ideas communities can implement member rating scales or automatic data processing procedures (Christensen, Nørskov, et al., 2017; Riedl, Blohm, Leimeister, & Krcmar, 2013).

Congratulating popular and relevant contributions made in the community will enhance the individual's perception that they receive intrinsic benefits from participation and thus boost a sense of commitment. These contributions and their increased visibility are likely to attract new members (Ang, 2011). The volume of information and number of publications available in an online community have a positive impact on new members because a large volume of content gives the impression of an active and dynamic community. This encourages members to make new contributions, which ultimately has a positive impact on the amount of information produced (Wiertz & de Ruyter, 2007) and thus on *participation* mechanism. It also, however, poses a new challenge – excessive volumes of information can produce unstructured discourse, making the identification of qualitative ideas difficult and decreasing participant engagement (Christensen et al., 2007; Dahlander & Frederiksen, 2012; Cheng & Vassileva, 2006).

Within a community, it is necessary to distinguish between the *quality* and *quantity* of contributions. These two metrics are not inherently correlated. Qualitative contributions are closely linked to extrinsic motivations, company feedback in brand communities and rewards, whereas quantitative contributions are linked to intrinsic motivations, monetary incentives, status advancement, friends' participation in peer feedback, company responsiveness and incremental rewards (additional rewards for outstanding contributions) (Chen et al., 2019; Dong et al.,

2020; Liu & Li, 2017; Wang et al., 2020; Ye & Nov 2013). Low contribution quantity or quality can be harmful to a community because they can limit the richness and performance of content and decrease the degree of effective *socialisation* that takes place within the community (Debaere, Coussement, & De Ruyck, 2018).

4.4.2. Gamification

Providing online community members with playful, gamified activities alongside relevant rewards has a positive impact on member engagement (Sousa-Vieira, López-Ardao, Fernández-Veiga, & Ferreira-Pires, 2020). The most common gamification techniques are those that use points, badges, and leader boards (Rapp, 2018). However, as perceived fairness in the issuance of gamification rewards, especially among new members, can affect commitment to the community (Leclercq, Poncin, Hammedi, Kullak, & Hollebeek, 2020), caution must be applied when deploying this approach. This driver impacts exclusively the *engagement* mechanism.

4.4.3. Physical events

The organisation of events adds rhythm and cultural salience to community life. Although events are often online, including webinars, competitions and meetings, in-person events can also be organised so members have the opportunity to meet and develop *emotional connections* (Mercanti-Guérin, 2010; Parmentier, 2015). Kim et al. found a direct effect of organising physical events on *participation* and social capital within online communities (Kim, Cichy, Zhang, & Yu, 2019). Ritualising these events can serve to boost member loyalty by transforming novice members into more active members (Schau et al., 2009), demonstrating their *commitment* to the community. This driver therefore affects *socialisation*, *engagement*, and *participation* mechanisms.

4.4.4. Competitions

Competitions, challenges, and other competitive activities are often a significant aspect of members' lives in online communities (Schau et al., 2009). Organising competitive activities provides an opportunity for members to meet and challenge each other on their ideas, having a direct impact on *socialisation* mechanism. There exist various levels of competition intensity, with team performance being determined by a range of social and intellectual forms of capital. In a very competitive event, the impact on *participation* can be negative, whilst in a lower intensity competition, the acquisition and nurturing of social and intellectual capital will positively impact team performance (Yen et al., 2011). If team performance is weak, it is possible that the quality or quantity of their contributions have been accordingly poor. This driver impacts *socialisation* and *participation* mechanism.

4.4.5. Collaborative work

In an online community, participants share common values and often work together on collaborative projects. Ling et al. (2005) note that participants who work to achieve group goals are more active in the community than those working on individual goals. In school contexts, co-creation exercises strengthen emotional commitment to a project (Wang & Sun, 2021). This collaborative effect is supported and stimulated by the implementation of toolkits and the organisation of physical meetings, competitions, and playful events (Ren, Li, Xiang, Cui, & Sakurai, 2010), thus affecting member *engagement* and *socialisation* mechanisms.

5. Discussion

This systematic literature review provides a comprehensive map of knowledge to date pertaining to the conditions of performance for online communities (see Fig. 2 and Tables 1–4 in the Appendix). It highlights some critical gaps and major trends in the literature that indicate key areas for future research.

In terms of the study's limitations, we acknowledge that some drivers were weighted more as key performance conditions than others. The most important drivers are considered here to be those which impact the most mechanisms (those that affect and promote performance in more diverse ways. The maximum mechanisms of performance impacted are three and concern ten drivers: *(i) A powerful technical platform, (ii) means of interaction, (iii) profile customisation, (iv) well-defined objectives and values, (v) defined roles and evolving statuses, (vi) community facilitation, (vii) identification of members, (viii) reputation of certain members, (ix) quality and quantity of contributions, and (x) physical events.*

Practical recommendations for managers directly arise from the findings of this literature review. These will facilitate the effective use of the ten drivers of performance in an online community, without neglecting the impacts of other drivers. Having *well-defined objectives and values,* and *Defined roles and evolving statuses*, can act as performance drivers which can be prepared prior to the launch of the community. Putting measures in place that foster these drivers will enable community founders to initiate a good structuration model and increase member participation from the outset. Some drivers depend solely on the technical quality and functionality of the community platform (*a powerful technical platform*, *means of interactions*, *profile customisation*, *identification of members*, and *reputation of certain members*). The platform that hosts the online community has a strong impact on these drivers of performance. It is vital to be vigilant and agile in creating its functionalities and continually improving these to meet the expectations of members. Two of the drivers highlight the necessity of continuously reflecting on process and the importance of adapting to the evolving trajectory of the community. *Community facilitation* needs to evolve as the objectives of the community and the motivations of members themselves evolve. The literature also highlights that *physical events* can have a strong impact on online community performance, and they can be necessary when starting up, or when promoting the community if it undergoes a slow-down in uptake.

The literature also shows that some drivers occur more frequently than others in the research to date. The five drivers most cited are *means of interaction, quality and quantity of contributions, various benefits and motivations for members, a powerful technical platform* and *identification of members.* These drivers comprised the focus of many authors, and this indicates the breadth and depth of evidence of their strong impacts on performance. Four of these five drivers impact all three mechanisms of performance. We considered drivers to be more instrumental for boosting performance if they affected more mechanisms. Therefore, special attention should be paid to preparing and developing the following four drivers: *Means of interaction, quality and quantity of contributions, a powerful technical platform* and *identification of members*.

Having identified the trends most present in the literature, we highlight some gaps in the research to date that need to be addressed in future research. To deepen the detail and widen the scope of our understanding of the most important drivers of performance, future research should identify the importance of each respective driver according to the typology of communities. For example, studies could investigate which drivers are the most important for a practice community, or whether *means of interaction* is as important a driver for a brand community as it is for a crisis community.

Future research into the interrelationships between different drivers should also be conducted. The drivers are likely to be causally interlinked, encouraging, inhibiting, or increasing the relevance of one another in a complex myriad of ways. How, for example, do *physical events* affect *the existence of emotional ties*? Another area of focus could be the ways in which the integration of *Toolkits* impacts the *quality and quantity of contributions*. A large-scale endeavour that identifies the full complex of these interrelations could use this paper as initial guidance.

We note the low number of publications on drivers of community contributions. Despite this being a central issue in community management, the articles mostly focused on efforts relating to qualitative and quantitative productions, remaining vague about the measures that need to be put in place by the community to encourage those

contributions. This suggests that a new research perspective could be developed that focuses on the different actions that must be implemented (e.g., the initiation of competitions, collaborative projects, physical events, or gamification) to encourage contributions. This study could also ascertain the links between these measures and their effects on overall performance.

The drivers pertaining to digital support emerged as crucial, yet our understanding of precisely *how* these tools drive performance across the mechanisms discussed here remains limited. The quality and quantity of contributions are critical drivers of performance, and authoring tools are key facilitators of content creation and idea generation. Future research could look into the types of tools and levels of complexity that are most conducive to idea generation, and how collaboration can be organised and encouraged by using these tools in the content creation process. Another key gap in the literature concerns the multiplatform nature of many contemporary communities. Many communities are deployed on the Internet via a combination of sites, forums, and social networks, and deepening understanding of how community coherence can be maintained most effectively on these would be useful. It would also be valuable to better understand the strengths, weaknesses, and unique characteristics of each platform type and how can they be used in ways that most successfully complement each other to affect improvements in overall performance.

We also note the low number of articles pertaining to the drivers affecting motivation mechanism. However, this low number of evocations does not reduce its importance. It can be explained by the fact that this mechanism represents the high-level of objectives and value formalisation (Parmentier, 2015). This important step is more often realised upstream of the community creation with the determination of objectives, challenges and the formalisation of values to create a common sense around which members come together. As this important mechanism is mainly present before the community creation, it explains why we do not see it often during the systematic review, which presents numerous drivers to help the community performance no matter its maturity. Further research, with a particular interest in this early phase of community creation could address this paucity of drivers addressing the motivation mechanism.

We found that three of the drivers have both positive *and* negative effects on engagement and thereby on community performance. *Quality and quantity of contributions*, *valuing members*, and *gamification* all had variable effects on performance that could be distinctly positive or negative. The impacts of these drivers on engagement were determined by the necessity of their integration (shaped by the nature of the community) and the maturity of the community. Concerning *quality and quantity of contributions*, having a vast number of disparate publications can drown users who do not know what to look at or how to interact with the community, prompting disengagement from the community. The *valuing members* driver can have unpredictable effects based on whether those valued are perceived to be deserving members, and making an error in this respect can prompt members to disengage from the community. In terms of *gamification*, rewards perceived as unfair can also prompt disengagement. Further research is needed to determine the positive and negative moderation effects of these drivers and what conditions need to be put in place to ensure a positive impact.

Also, we identify two emerging trends that the systematic review flagged up. Firstly, studies of online communities appear to be increasingly popular in the medical sciences. Patient and carer communities are flourishing as members seek to reassure and support fellow patients (Jung et al., 2015; Yang et al., 2021). This trend should be explored further. The effects of online communities on medical practice must be better understood so that practitioners and policymakers can promote and utilise these communities to achieve improved patient outcomes. Secondly, the automation of text analysis means that algorithmic tools are being increasingly used in online communities, with the aim of quickly identifying, evaluating and interpreting qualitative ideas and contributions. Much research has been conducted into the wide variety of such tools used in brand or innovation communities (Christensen, Nørskov, et al., 2017; G. A. Wang, Yin, et al., 2013). A future study could identify which tools are most effective in specific contexts and what their impacts are on community performance, for example the degree to which different tools save time and maintain reliability, and which types of communities should select specific types of tools to boost their performance.

To conclude this discussion, we identified some methodological limitations to this systematic literature review. First, we are aware that the literature in this field is constantly growing. We may have omitted some sources that would have been relevant to our analysis. Also, we based the literature review on a keyword search identifying the terms "performance" and "online community" only in article titles and abstracts. It is possible that some articles deal with this subject without mentioning it clearly in their title or abstract. We would then have missed it. Secondly, the mention of the mechanisms or drivers is not always explicit in the articles but sometimes interpretative. However, comparing the interpretations of the two researchers involved in this study with a discussion of the discrepancies helped to limit analysis bias. Finally, we considered a diverse range of articles in this literature review, both theoretical and empirical. This mix may alter the generalisation of the results.

6. Conclusion

The ongoing public health crisis (surrounding COVID-19) and the rapid evolution of our technological environment have combined to make online communities an even more important part of our daily lives. Enabling online communities to become more dynamic and facilitating their achievement of objectives are challenging tasks. This literature review identifies 24 drivers whose implementation affects community performance across five performance mechanisms: socialisation, structuration, engagement, participation, and common motivation. We highlight that ten of these drivers have impacts across at least three of the performance mechanisms and that these should be taken well into account as key priorities for community managers. We insist on the imperative to conduct future research into the impacts of these drivers according to type of community, the ways these drivers promote contributions in communities, and the effects of platforms' tools and functionalities on the overall performance of online communities. Studies should also explore the effects that certain moderations can have on drivers that demonstrate both positive *and* negative impacts.

The list of drivers identified and discussed here is not exhaustive. The article is based on 178 academic papers published in the last 20 years, and the aim was not to identify a comprehensive list of drivers of performance but rather to highlight the main drivers discussed in the literature to date. We are aware that more specific drivers could be defined and conceptualised by focusing exclusively on certain types of online community. It is also likely that new drivers will emerge over time, as user interests, technologies and platform designs change and develop. This article has highlighted critical emerging trends in scholarship pertaining to online communities, and has posited some practical recommendations for community builders, managers, and content creators. The overview of the total of 24 drivers identified, and the detailed analyses of the ten drivers we cover here, will prove valuable for founders and managers of online communities, regardless of the age or objectives of their communities.

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