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The Rise of the Promoters: User Classes and Contribution Patterns in Enterprise Social Media

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Abstract: The proliferation of enterprise social media (ESM) has created opportunities for employees to self-organize around common goals or interests. However, little is known about the different user classes that exist in ESM and the factors that drive contributions to ESM communities. Using multilevel analyses of secondary data from the ESM of a global organization, we find that (1) although ESM

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communities reflect a core-periphery structure similar to that identified in other forms of online communities, nearly two-thirds of the users represent promoters—a distinct class of users who use the platform primarily to post promotional content without viewing existing content created by others; and (2) despite individual differences in user type, the actual contribution to an ESM community is the result of an intricate interaction between a user's disposition for participation and a set of group characteristics. Our findings suggest that recognizing the unique contribution patterns of different user groups is key to understanding participation in ESM communities.

KEY WORDS AND PHRASES: collaboration, enterprise social media, group size, group visibility, online communities, promoters, social media participation.

The literature on online communities has burgeoned in the past two decades, due in part to the vast success of various famous instances of online organizing, including open source software communities, such as Linux, and other collaborative projects, such as Wikipedia [23, 25, 44, 72, 87]. More recently, the adoption of social media technologies in corporate settings has resulted in an emerging research domain focusing on their potential organizational benefits. We use the term "enterprise social media" (ESM) to refer to proprietary social media technologies that are used within the closed boundaries of an organization, and "ESM communities" to refer to groups of users with shared interests or goals that emerge within these systems.

The research on ESM has proliferated during recent years, partly due to the vast investments companies have made in this new group of collaborative technologies and their increasingly widespread adoption [29, 80]. The literature on ESM to date has focused on the potential organizational benefits associated with use of these systems, such as their unprecedented opportunities for knowledge sharing and innovation [54, 55]. However, we know little about the real usage of ESM in organizations, the types of users that exist within the context of these systems, and their distinct usage patterns.

With four out of five companies currently using ESM [80] and worldwide corporate spending for these technologies estimated at $100 billion [26, 39], it is imperative to understand the ways in which individuals and teams use these systems and for what purposes, especially in light of recent statistics showing that less than half of these technologies get regular engagement from employees [58]. Given the novelty of ESM as a field of inquiry and the dominance of the individual as the unit of analysis [5, 18], a focus on ESM communities can significantly enhance our theories about collaboration in organizations and our understanding of the organizational implications and benefits associated with using these systems.

In this research, we address the following two research questions: (1) what are the different classes of users that exist in ESM communities, and (2) do these different user classes contribute to different types of ESM communities. To inform our

theorizing about the types of user classes in ESM communities, we draw upon the extant literature on core-periphery structures in online communities. In addition to the core and peripheral users [15, 85], we expect the existence of a distinct class of users in ESM communities that has received limited attention in online communities literature [28, 57, 85]. This new class of users is characterized by a tendency to contribute more content than they consume for the primary purpose of promotion and reputation building, which may in turn affect the overall performance of the system [59].

This simultaneous focus on both the individual users and communities (i.e., individual/group level) as embedded in ESM is particularly important given the organizational context of this study and the fact that organizations increasingly use temporary structures, such as project teams and task forces [10]. Hence, understanding how individual differences in user behavior and usage motivations affect the likelihood and nature of participation in groups is imperative.

We studied data from 3,116 blog posts created by 359 users across 363 unique groups within the ESM community of a large, multinational product development organization to further our understanding of (1) the classes of users that exist in ESM communities and their motivations to contribute and (2) the effects of group characteristics on their participation behavior. We first adopted a data-driven, exploratory approach and utilized cluster analysis to delineate distinct classes of users within ESM communities based on their information contribution and consumption behaviors. We also conducted a series of interviews with users to obtain more in-depth, qualitative insights regarding the nature of their behavior and their underlying motivations. We then investigated the effects of group characteristics, specifically group visibility and group size, on users' contribution to a group.

Our findings show that ESM communities display participation inequality that is typical of traditional online communities. A small core of contributors makes a significant portion of the contributions, while a large periphery of contributors largely view the content and make contributions sparingly. We also found that the largest group of users post content significantly more than they consume, providing evidence to support the existence of a new type of users—the promoters. The results from the second phase of the study further indicate that the proposed group characteristics—group visibility and group size—have unique impacts on the contributions of each user class. While core-periphery users prefer to contribute to closed and/or large groups, promoters prefer to contribute to open and/or small groups.

The findings of this study have implications for researchers seeking to understand the real usage of ESM in organizational settings, the classes of users that exist in these systems, and their distinct usage patterns and diverse contributions in different communities. Furthermore, managers who seek to encourage ESM use may benefit from our results to better understand different classes of users in terms of their dispositions to contribute to ESM communities and their preferences for participating in different types of communities. These insights can be used to encourage appropriate usage behaviors that may in turn lead to greater adoption of these tools.

Theoretical Background

In what follows, we present the theoretical foundations underpinning this study. In relation to our first research question, we offer insights into existing conceptual models for understanding different groups of users and their diverse motivations for contributing to online communities. To answer our second research question, we then present prior theories on important group characteristics that may affect different user groups' contribution to different types of ESM communities.

ESM communities share important similarities with online communities occurring outside of enterprise settings, specifically the collective and highly fluid nature of activities and information sharing and the potential for collaboration with unknown others residing elsewhere in the company [23]. We believe that ESM communities will reflect important structural elements of online communities. For example, we expect ESM communities to exhibit the same type of participation inequalities that exist in online communities, where the vast majority of work is performed by a relatively small number of users. Extant research has demonstrated the advantages of this unequal type of community participation structure [49].

On the other hand, several distinctive characteristics of the enterprise setting suggest that ESM communities will also differ from online communities outside the enterprise context. First, since individuals are contributing in the context of their general job performance, their disposition to participate in ESM communities may differ. Successful contributions might lead to offline benefits, such as positive performance reviews, raises, or promotions as well as enhanced workplace visibility. Thus, we expect to observe different types of usage patterns than previously observed in online communities, and aim to explore the different classes of users and their behavioral motivations in ESM communities.

Second, ESM communities allow users to participate in different types of communities that are created to serve different goals and purposes. Given that different classes of users will have different dispositions to participate in ESM communities, we also aim to explore whether an interaction exists between the user classes and the types of communities with which these users are associated. Specifically, we examine whether different classes of users prefer to contribute to different types of communities. We argue that group visibility and group size, the two key characteristics of a community, play an important role in users' selection of and contribution to a community. Hence, we hypothesize that different classes of users gravitate toward certain communities depending on their underlying disposition for participation.

Identifying User Classes and Their Contribution Behaviors in ESM Communities

The core-periphery model is a common model for understanding contributions within online communities [15, 85]. Core-periphery structures, characterized by a large mass of periphery users and a small group of active contributors (i.e., the core),

have been identified for various online communities and public social media, ranging from open source software communities [74, 75] to Q&A communities [45], music communities [30], users of digital libraries [8], and groups of people interacting through blogs [4, 67].

The notion of such a core-periphery structure can be traced to offline social movements [62, 63, 68]. These concepts were subsequently adopted by the organization studies literature through theoretical frameworks such as the theory of legitimate peripheral participation [53] and the reader-leader framework [70]. These frameworks of professional communities and social participation also propose that the majority of participants in a community offer only minimal contributions (i.e., the periphery users), whereas a small group of members (i.e., the leaders or core users) perform the majority of the work [53, 70].

This notion of a core-periphery structure is also utilized widely in social network analysis [9] and other diverse fields of inquiry, such as world systems [77], economics [48], organization studies [24], and scientific citation networks [66] to understand the dynamics of collective action and the emergence of elites. More recently, it has been applied in the context of Web 2.0, online communities, and social media, such as open source software [74, 75], blogs [4, 67], and crowdsourced customer support forums [60]. Here, the notion of a core-periphery structure represents the emergence of two distinct classes of users that occupy varying levels of importance within online communities from the perspective of content creation—the core users and the peripheral users. Core users are the central actors and constitute a group of active contributors within the online community who are connected to other core and peripheral users. Peripheral users, by contrast, represent a group of users who are typically connected to central actors and not each other. Core users, who generally represent the minority in terms of membership of the online community, generate the majority of the content, whereas the peripheral users, who present a sizable portion of the online community, remain largely inactive and contribute only occasionally.

Thus, a small group of leaders exert considerable influence over the interactions and collaborations in online communities. Existing studies have shown how participation inequality—that is, the core-periphery model—results in essential and optimal patterns of knowledge sharing and community development in virtual settings—only up to a certain level, after which extreme participation inequality may limit knowledge sharing [49]. Indeed, Lu et al. [60] recently demonstrated how an extreme core-periphery structure may create barriers in the knowledge flow to new customers in the context of crowdsourced customer support platforms. Nonetheless, the concentration of epistemic interactions within a small group of highly resourceful individuals that is responsible for the majority of contributions results in the emergence of an ideal community structure that not only leads to greater knowledge sharing but also facilitates the management of potentially chaotic processes [19, 64, 82]. Similar to the notion of core-periphery structures of online communities, the concepts of the long tail, the power-law distribution, and the 80/20 principle have been used in the literature to describe the same phenomenon, where 80 percent of content in an online community is created by 20 percent of the users,

that is, an elite class of core users, and the remaining 20 percent of content is generated by the greater periphery [47].

Given the collective and highly fluid nature of activities and information sharing in ESM communities, the potential for collaboration with unknown others residing elsewhere in the company [23], and the abovementioned inherent information-sharing benefits of the core-periphery structure, we believe that participation concepts like core-periphery structures, the long tail, and the learning trajectory model also apply to the enterprise setting. Consequently, we expect to observe a relatively elite class of core users who generate the majority of content and a group of peripheral users who generate content occasionally.

The Rise of Promoters: Prior studies of online communities suggest that individuals participate in online communities for a variety of intrinsic and extrinsic motivations [50, 84]. Some of these studies argue self-interest as a driver of participating, highlighting the benefits individuals can receive from the community, such as new knowledge, insight into others' beliefs and opinions, and access to expert advice [38, 51]. Recent studies have also highlighted the role of external resources—such as attention currency—as a driver of social dynamics in user-generated content environments [57]. Other studies have highlighted altruistic motivations and individuals' desire to help others, such as contributing to collective goals [16, 17], ensuring continued existence of the community [84], and reciprocity [16, 85]. These explanations mostly discuss the intrinsic benefits that may drive individuals to participate in an online community.

While these intrinsic motivations may also exist in ESM communities, we suggest that there may be differences, mainly due to the possible extrinsic benefits associated with being an employee in the organization. Individuals may use ESM communities not for the intended purpose of knowledge sharing, but to enhance their reputation or status [34, 50], expand their professional network [14] and build new relationships [21, 22], or to establish a more positive self-image [16]. Furthermore, the widespread visibility of content in ESM [79] may also foster selective self-presentation and self-promotion, not only for enhancing one's image and reputation but also to obtain more tangible outcomes, such as salary increases or promotions. At the same time, concerns over job security or the accidental distribution of intellectual property or confidential client information [31] may also result in the selective sharing of positive self-presentational posts rather than valuable knowledge and project-specific information.

For instance, Walther [83] showed how social media are used for selective self-presentation, as the ability to create and edit messages may lead to manipulation or selective information sharing. Treem and Leonardi [79] theorized that employees use knowledge-sharing technologies strategically to foster perceptions that they are experts in areas in which they wish to gain expertise rather than areas in which they are already experts. Kingsley Westerman and Westerman [46] similarly reported practices of selective self-presentation in their analysis of supervisor impression management within computer-mediated communication channels.

Although the importance of attention currency in driving individual contribution behaviors has been observed in the context of user-generated content platforms outside organizational settings [57, 78], one critical difference is that promotion behaviors in ESM communities are not solely directed at increasing individual visibility and reputation. Contribution behaviors may also aim to increase the visibility of teams in organizational settings, an activity known as representation [1]. Representation involves lobbying up the corporate hierarchy to create favorable impressions about team activities and successes among senior managers with the aim of obtaining access to critical resources, including monetary support, high-level commitment, and legitimacy. Group-level promotional behaviors in an organizational setting constitute an important distinction from the domain of user-generated content platforms where users are not part of a team that is evaluated based on the performance of a project.

Finally, existing research has reported how ESM users seem to leverage these platforms to supplement corporate directory information to create a greater awareness of their existence in the organization. As reported by Muller et al. [65] in an investigation of user behaviors within IBM's Beehive, users seemed to engage in high levels of self-presentation, with 79 percent of users tagging content about themselves. Although such self-promotion behaviors may also be "people sense-making" [21, 22], thereby generating additional opportunities for collaboration [65], the authors found that tagging content about oneself constituted the sole tagging activity of 51 percent of users, further underscoring the proliferation of self-promoting behaviors in ESM.

Hence, we expect that differences in ESM users' motivations may give rise to an additional and important class of users—referred to here as the *promoters*. Similar to the core users in online communities, promoters will display high levels of contribution behavior. However, unlike core users, who aim to serve the overall goals and interests of the online communities by both contributing and consuming content, promoters post self-promoting content without engaging with the content shared by others. Thus, these promoters' high levels of contributing behaviors will be combined with a general lack of consumption behavior. Hence, it seems that promoters' usage behavior primarily centers on competing for attention in the context of ESM—an information-intensive environment or "knowledge market"—rather than paying attention to the contribution of others, which constitutes a novel form of free ridership [35].

The existence of these promoters goes against previous assertions that people are unwilling to contribute knowledge to knowledge-sharing platforms in an enterprise setting because it diminishes their value as employees [33]. On the contrary, people contribute information more precisely because they believe it will increase their visibility and enhance their perceived value within the company [35].

The Roles of Group Characteristics in Users' Contribution Behaviors

Prior research argues that while individuals might have individual preferences and dispositions for sharing content with others and participating in social communities [6, 76], they may also behave differently in different types of communities [7, 42, 43].

For example, by investigating individuals playing multiple characters in a virtual world, a recent study proposed that network consistency across roles can be an indicator of behavioral dispositions and personality brought to the characters played [11]. Similarly, we propose users' overall individual participation activities across the system as a proxy for their individual disposition for participating in ESM communities. Then, controlling for individual dispositions, we propose to examine how group characteristics predict users' participation behavior in a community.

Heretofore, we have only suggested that each class of users has a different disposition for participating in the ESM community. While the core users participate actively by both contributing and consuming content in order to advance the community, the promoters participate by contributing far more content than they consume. The periphery users display largely passive participation in the form of consuming existing content. Drawing on prior research, we further argue that controlling for users' disposition for participating in an ESM community—as discussed in the previous section—each class of users' preference for and contribution to a community will be affected by two key group characteristics—group visibility and group size. In what follows, we discuss the effects of group visibility and group size on the contribution behaviors of different classes of users.

Our primary reason for selecting group visibility and group size as the two key group variables is that these measures are directly related to attention-seeking and self-promotion characteristics, which constitute our primary focus. Group visibility, as the most foundational affordance of ESM [79], facilitates self-promotion by enabling individuals to publicly share their content, that is, for everyone in the organization to see. Group size is reflective of greater competition for attention, which is often the scarcest resource in information-intensive environments [35]. Both mechanisms are explained in further detail below.

Group Visibility: The ESM platforms on which ESM communities operate are characterized by a unique and distinctive trait that sets them apart from other technology-mediated communication and collaboration technologies—namely, the visibility affordance [54, 55, 79, 81]. The visibility affordance refers to the extent to which external members can view the content, communication activities, and network structures of a particular user or group of users [79]—which were largely invisible before the advent of ESM [55, 79]. Visibility is therefore closely related to the amount of effort people must invest to locate and retrieve information [79]. It represents a fundamental system property that gives users the ability to enact their privacy preferences at both the individual and group levels, hence enabling or restricting access to resources. Although largely treated as a beneficial driving force in enabling open and visible information flows within the organization, visibility equally provides opportunities for restricting information access to members from other ESM communities embedded within the same ESM platform.

The visibility affordance gives users the option to share selectively with others, and as a result gives rise to two distinct sets of communities, namely, open groups versus closed groups. While the content of open groups is visible to nonmembers, the content of closed groups is not. Open groups often function as vibrant bulletin

boards and are used for more generalized information sharing, given that the audience is the entire organization. Closed groups, on the other hand, present a stronger community structure similar to traditional online communities because the audience is identical to the size of the group membership rather than the organization in its entirety. These closed groups are typically organized around a common goal or by people who share common interests, in largely the same way as a community of practice [53].

We argue that the different classes of users—promoters, core users, and peripheral users—display distinct preferences for contributing to open versus closed communities. Although previous research on knowledge sharing in virtual teams has suggested how individuals' fear of making themselves less valuable by sharing too much knowledge or information may prevent them from contributing in virtual settings [33], recent studies have suggested that the opposite may be true due to the visibility affordance of ESM [54]. The manipulation of visibility settings, as afforded by ESM, allows users to selectively self-present their identity and ideas and/or limit the audience with whom content is shared, thereby eliminating concerns regarding job security or the risks of sharing confidential information or intellectual property [31, 81].

We postulate that people who display interaction patterns similar to those of online communities outside the enterprise setting (i.e., core and periphery users) are participating for reasons similar to those of participants in traditional online communities—to engage in a dialogue with a closed community of users with whom they share ties and connections. Posting information to open groups that are available to users system-wide may increase their vulnerability and limit their interactions. Given that content in open groups is visible to anyone in the organization, sharing project-related and personal information may result in concerns over job security, accidental distribution of intellectual property, leaking of confidential client information [31], and/or a perceived lack of psychological safety [32]. Hence, we anticipate that these types of users are more likely to contribute to closed groups where they can control their audience. As a result, core and periphery users naturally gravitate toward closed groups to enhance goal achievement and to avoid the vulnerability of sharing sensitive information with unknown or unrelated others.

On the other hand, promoters engage with ESM primarily for self-presentation and promotion of their content and seek to obtain maximum attention [35]. They are not motivated by engaging in a dialogue with content generated by others. We expect promoters will contribute more to groups where they can boost their reputation and, thus, they will naturally gravitate to open groups where their contributions enjoy broader organizational visibility. Therefore, we anticipate that core-periphery users will display higher levels of contributions in closed groups, whereas promoters will contribute more to open groups.

> *Hypothesis 1: Different user classes display distinct preferences for contributing to open versus closed groups, such that: (H1a) Promoters are more likely to*

contribute to open groups rather than closed groups; and (H1b) Core users and (H1c) Periphery users are more likely to contribute to closed groups rather than open groups.

Group Size: Previous research has further suggested that group size is an important antecedent to group interactions and performance [37, 73]. Similarly, we propose that, when controlling for each group of users' individual disposition for participation and the preferred group visibility, group size is an important additional predictor of contribution to ESM communities.

When individuals represent key sources of information and other resources, group size can be a reflection of group members' level of access to knowledge and resource variety provided by a social structure [12]. Aggregation of resources possessed by group members would typically make *larger* groups more advantageous, as larger groups lead to individuals *accessing more resources* [69, 86]. Membership size can also be a measure of the level of "audience resources," as accessible listeners can be a vital resource for individuals who intend to seek advice or resources [27, 61, 71]. Hence, individuals are typically expected to benefit from a large group size given the greater amount of resources that can be accessed.

This resource-access argument will play out differently in open versus closed groups. Within closed groups, only members can read and write content; hence, audience size and membership size are inherently the same. In this context, greater membership size may help develop greater bridging ties while not reducing the cohesiveness of the group. Since both core and periphery users value the resources available to and in the community, we suggest that within their preferred group type (*closed*), both core users and periphery users will gravitate toward larger groups that allow them to leverage the resources available from a larger audience and within bridging ties, resulting in greater social or other benefits for the group [12].

In open groups, the audience of the contributed content is always the total sum of employees of the entire organization, since anyone can read content produced in the open group. Promoters may not be interested in large groups, since they are primarily contributing rather than consuming information, and therefore do not benefit from a greater number of members. Then, group size may be reflective of greater competition for attention, which is often the scarcest resource in information intensive environments [35].

Research has shown that the less information offered by a supplier, the more attention it received, mainly due to the reputation of the supplier for quality and focus [13, 35]. The more people contribute to a group, therefore, the less attention a single post will receive from the audience in the content of ESM communities. An increase in membership size in such situations can also lead to logistical problems [36, 41], as individuals may have fewer opportunities to participate and may have to compete for attention [12]. Hence, although larger membership leads to greater resources, it may also make it more difficult for promoters to benefit from the available resources, in this case, the attention allocation resulting from the organization-wide audience [55].

In open groups the audience is already maximized, so rather than gravitating toward larger groups where their contribution might be lost among other contributions competing for attention, promoters contribute to where they think other users would see their content. We argue that to avoid or minimize competition for attention and to draw more attention to their own content, promoters prefer to contribute in small groups where fewer contributions are made by fewer group members.

Hypothesis 2: Group size is an additional predictor of a user class's contribution to a given group, such that: (H2a) Promoters contribute more to small groups rather than large groups; and (H2b) Core users and (H2c) Periphery users contribute more to large groups rather than small groups.

Research Setting and Method

This research was conducted in a multinational corporation that provides technology products, furnishings, and research and consulting services to corporate offices worldwide under various brands. The company has over 11,000 employees around the globe who are located in the United States and more than 40 countries and 80 locations, including the Americas, Europe, Asia, Africa, Australia, and the Middle East.

The company announced the global launch of an ESM system (hereafter: Inspire) in the spring of 2012. Inspire is built on the Jive platform (developed by jivesoftware.com), one of the largest providers of corporate social technologies with an extensive customer base, including Nike, Hewlett-Packard, T-Mobile, PricewaterhouseCoopers, and the World Bank. The key motivation for implementing Inspire was to offer an umbrella tool that supports employee communication and collaboration activities along with their business connections through its built-in functionalities typical to most social media systems, including blogging in individual and group spaces, social bookmarking, and group chatting. The adoption and use of Inspire has grown rapidly, mainly due to the company's C-level executives leading by example through strong involvement with the system.

Usage of Inspire is largely self-regulated and subject to cultural norms and values, that is, it has not been governed through any written policies or hard guidelines. Although Inspire was not explicitly implemented to serve as a project management tool, given the company's usage of an already existing formal and mandatory system for project management, Inspire actively operates as an informal, voluntary, and largely amorphous platform for existing project teams to optimize their within- and between-team interactions and collaborations. Inspire is reported to be primarily useful for the early collaboration stages during which team members socialize and create broader organizational awareness for their projects. Nevertheless, existing users emphasize that Inspire facilitates content sharing worldwide and thus has the

potential to empower novel inter-unit and cross-team connections, enhance transparency and awareness, and expand possible external involvement in collaborative team projects. Furthermore, Inspire offers strong support for individuals' advancement of personal agendas and for the creation of informal organizational groups characterized by a mix of professional and social goals. The dominant form of content sharing in the system is blog posts that revolve around individual-level and group-level blog spaces.

This study focuses on the behavior of users who are active within group spaces and explores the effects of both individual dispositions for participation and group characteristics on user behaviors within communities. Data collection was carried out using the system log data for system users' within-group interactions for both group types and outside group activities that are mainly held on individual spaces (i.e., individual blogs). Given our focus on ESM communities, that is, on groups operating through ESM, our first step in determining the appropriate population for our study was to focus on system users that are registered as members of a group rather than just as mere members of the system as a whole (i.e., post in individual blog spaces). The number of Inspire users with membership in an open and/or closed group is 1,413 users.

From these 1,413 users, we applied two additional criteria to our final sample. First, we deleted users who were members of an open or closed group that contained less than two members, given that groups with a single member cannot be considered groups. Second, we deleted users who were registered members of an open or closed group but who displayed no participation behavior over the lifetime of the group, that is, not a single posting or viewing behavior. Following these two decision criteria, our final sample consisted of members of an open or closed group with at least two members and who have displayed at least one viewing or posting behavior in the history of the group. In total, the data were collected from 359 users in 363 groups who posted a total of 3,116 posts. The approach to data collection and analysis as well as the background information on the study context will be provided in the following.

Data Analysis and Results

To answer our first research question regarding the different classes of users that exist in ESM communities and their diverse motivations for contributing, we first present the findings from our data-driven approach using cluster analysis. Then we discuss the insights from a series of interviews to understand the types of users that exist in ESM communities and their distinct motivations underpinning diverse usage behaviors. To answer our second research question pertaining to whether different classes of users prefer to participate in different types of communities, we present the findings from our hypotheses testing regarding the interaction of user classes with group characteristics.

To identify the different classes of users and examine the existence of the promoters, we employed a two-step cluster analysis procedure using SPSS. Subsequently, we conducted interviews with key employees and analyzed the transcripts of these interviews to understand users' motivations for using Inspire. The details of our analysis and the findings are discussed in the following sections.

Identifying User Classes through Cluster Analysis

To identify the type of users that exist in an ESM community and examine whether a distinct class of users can be distinguished in an enterprise setting, we employed the two-step cluster analysis procedure using SPSS. Cluster analysis is an accepted method for inductively identifying user types in the context of online communities. For instance, Füller et al. [28] used cluster analysis for understanding user types in innovation-contest communities.

We defined the clusters by using the data that are collected at the individual level reflecting users' overall posting and viewing behaviors in their individual spaces (e.g., individual timeline, blog posts, etc.). We selected two-step cluster analysis, which starts by preclustering and then proceeds to actual grouping using an agglomerative clustering algorithm (i.e., hierarchical clustering method). In the process of agglomerative clustering, Schwarz's Bayesian information criterion (BIC) is used to select which number of clusters is "best," thus resulting in the optimal cluster solution. The primary benefit of using two-step cluster is that it automatically selects the number of clusters. This task is normally performed by the researcher and thus, it is subject to biases. Hence, we have two major reasons to utilize the hierarchical clustering method. First, given the exploratory nature of this study, the automatic clustering approach focused on generating the optimal cluster solution is preferable over other clustering methods. Second, in cluster analyses where all variables are continuous in nature—as is the case with the posting and viewing variables used in this study—two-step cluster has been found to generate the best solutions [3]. The results of the auto-clustering algorithm using Schwarz's Bayesian criterion provided a four-cluster solution, not the three-cluster solution we expected, consisting of core, periphery, and promoter classes. The quality of the cluster solution was 0.6, which is above the 0.5 threshold for good quality. The ratio of size comparing the largest to smallest cluster was 12.75. Although ideally in cluster analysis the ratio of size does not exceed 3,[1] this larger ratio size is to be expected in online community participation, given the unequal distribution of contribution behaviors by ESM communities that is well-documented in the literature [49]. That is, we anticipated the peripheral user class to be much larger than the core user class. Thus, a ratio size of 12.75 further confirms the long-tail distribution or core-periphery structure that we anticipate. The cluster analysis identified four distinct types of system users. The resulting clusters contained 16, 36, 204, and 118 cases, corresponding to 4.3 percent, 9.6 percent, 54.5 percent, and 31.5 percent, respectively.

Table 1: Cluster Analysis Results

Cluster #	1	2	3	4
Cluster Label	Core Users	Super-Promoters	Promoters	Periphery Users
Cluster Size (*N*)	16	36	204	118
Cluster Size (%)	4.3	9.6	54.5	31.6
Input Variables:				
Input Variables: (Posting)	40.62	38.19	5.50	4.05
(Viewing)	49.25	4.50	2.13	14.48
Posting to Viewing Ratio	*1:1.2*	*8.5:1*	*2.6:1*	*1:3.6*

Descriptive statistics for each cluster can be found in Table 1. A closer examination of these descriptive statistics shows not one, but two distinct classes of promoters. The hypothesized promoter class actually represents the largest cluster of users in the sample, consisting of about 55 percent of all users of the system. These users make on average 5.5 contributions but view only an average of 2.13 posts, a posting-to-viewing ratio of 2.6:1. Thus, we find strong initial evidence for our first hypotheses, identifying the presence of this unique type of participant in ESM communities. Furthermore, not only does our analysis identify the existence of this type of participant, but, somewhat surprisingly, it suggests that this type of participation is the predominant way of interacting with the system.

Nevertheless, the existence of promoters does not present a complete perspective. Our cluster analysis identifies an additional cluster of promoters—labeled "super-promoters"—that exhibit more extreme behavior. Although a smaller group than the promoters, consisting of only 36 users, these users post a massive amount of content. Users in this cluster average over 38 posts each but view less than five, resulting in a posting-to-viewing ratio of 8.5:1. Although a relatively small group, this cluster actually accounts for more content than does the entire cluster of regular promoters. Thus, in much the same way as the observed core-periphery structure, we further observe the same participation inequality among the promoters, namely, a large body of general promoters with a small core of extremely active super-promoters.

Unraveling User Behaviors through Interviews

Data Collection and Procedure: The results presented in the previous section provide compelling initial evidence in support of the existence of promoters in ESM communities, representing a substantial group of people that contributes to the system far more than it consumes. To better explain the nature of these user groups and their respective usage behaviors as well as to provide insight about how and why users engage in these specific system interactions, we conducted a case study by interviewing a small number of system users. The list of the participants'

departments, locations, and user class (as validated through log data) is presented in Table 2. To recruit the study participants, we used a purposive sampling approach, focusing on a group of respondents from different user classes, geographical locations, and functional departments. We also recruited a sample that is reflective of the proportions of user classes in the overall population of Inspire users that is approximately 4.3 percent core users (1 participant), 9.6 percent super-promoters (2 participants), 54.5 percent promoters (5 participants), and 31.6 percent periphery users (5 participants). Nonetheless, an interview sample bias may exist given the relative underrepresentation of particular user groups in our sample vis-à-vis the population. We confirmed that the selected participants belong to the given user classes by using their unique system identification numbers in the system log data.

Each interview lasted between 40 and 65 minutes. The interview process was designed to provide the respondents with an opportunity to share unique personal stories about and experiences with Inspire. The interviewer first asked their opinions about using Inspire in an organizational setting, opportunities associated with its use, and the potential avenues for positive change and the desired future designs and aspirations. The interview protocol included asking the respondents to share a unique personal experience of interaction and collaboration, to describe the personal significance of the event as well as the role of the system in this event. Following this personal reflection, the interview protocol continued with a set of semistructured questions to capture the respondents' views on: (1) the advantages of using Inspire, (2) their usage patterns and behaviors, (3) the effects of system use on workplace interactions, sense of connectedness, and visibility of their individual or team activities, (4) ideal-use situations, and (5) necessary changes to improve Inspire's potential for enriching communication and collaboration activities.

Data Analysis: The recordings of these interviews were transcribed verbatim and imported into a qualitative analysis software application for coding and further

Table 2: Overview of the Participants

Resp.	Position	Location	User type
1	Design researcher	U.S. Headquarters	Periphery user
2	Design researcher	China	Promoter
3	Senior researcher	U.S. Headquarters	Promoter
4	Senior consultant	Brazil	Promoter
5	Applied research consultant	Canada	Super-promoter
6	Engineer, product development	U.S. Headquarters	Periphery user
7	Interior designer	U.S. West Coast	Periphery user
8	Project manager	Mexico	Periphery user
9	Consultant/services	U.S. Headquarters	Core user
10	Engineer, product development	Malaysia	Super-promoter
11	Sales, product manager	Hong Kong	Periphery user
12	Product marketing	U.S. Headquarters	Promoter
13	Design researcher	France	Promoter

thematic analysis. The data were analyzed by two of the authors of this study, and an initial interrater reliability of 89 percent agreement and .71 Cohen's kappa provided a strong assessment of the coding process reliability and the emergent coding scheme validity [52].[2] Data analysis comprised three main stages: the first data analysis stage began with listing every user motivation regarding using Inspire. The purpose was to identify the underlying motivations for both posting and viewing comments on the system. The results of this phase were a number of individual and team-related motives that drive users' posting and viewing behavior (or lack thereof). In the second stage, we thoroughly reviewed the existing taxonomies and theories regarding system use in the online community literature. Using the insights from the first and second stages, we then identified the similarities and differences among user groups in terms of their motivational dispositions toward participating in ESM communities, either in an active (contributing) or passive (consuming) way.

Results of the Case Study: The findings of our interviews provide further insight into the nature of user behavior across the four distinct user classes, suggesting that the majority of people are using the system for selective self-presentation and promotion activities. However, despite the consistency in their behaviors, diverse motivations and reasons seem to underpin these self-presentation and promotion behaviors and nuances appear to exist in the motivations of super-promoters compared to regular promoters. In what follows, we discuss in detail the nature of user behaviors for each of the four user classes, super-promoters, promoters, core users, and periphery users. Table 3 presents a summary of our findings.

To support the interviews and provide further evidence for the motivational and behavioral differences across different user classes, we randomly retrieved 10 percent of the blog posts from the ESM. We included some of these posts as illustrative examples of the actual posting behaviors of the distinct user groups in Appendix 1. The selected blog posts show consistency between the motivations mentioned in the interviews and the actual posting behavior on Inspire. The challenge, however, for peripheral users is that given that their primary ways of interacting with the system are passive—that is, searching for content and looking up people—both uses cannot be observed from the posts of these users. However, the majority of posts from peripheral users contain questions or requests for feedback confirming that their use of the ESM is largely to obtain information from other users. Similarly, for super-promoters, their desire to connect with other influential users of the system cannot be observed from the content of their posts directly, yet, their posts do reveal a high level of name-dropping, which may be indicative of the desire to be identified with influential others in the organization.

Super-promoters (Self-minded). Based on the salience of the themes in the interviews with super-promoters, the most frequent usage behavior can best be categorized as personal reputation building—that is, contributing content primarily geared toward building the contributor's reputation within the organization. The findings of our interviews demonstrate that the majority of super-promoters use the system for the purpose of selective self-presentation, personal branding, and self-promotion activities in order to gain visibility in the organization. For example, one respondent

Table 3: Understanding Usage Behaviors of User Groups Through Qualitative Analysis

	Core users	Super-promoters (Self-minded)	Promoters (Community- minded)	Periphery users
Observed activity differences (Cluster analysis)	Posts and read frequently	Post frequently, but read rarely	Post occasionally and read rarely	Read regularly, but post rarely
Behavioral and motivational differences (Interviews)	• Sharing ideas and knowledge for open innovation • Creating and coordination projects for team success	• Posting for personal reputation building (attention currency) • Connecting for personal reputation building	• Posting for personal reputation building (attention currency) • Posting for team reputation building (representation)	• Reading news about the company to feel connected • Looking up people prior to meetings

emphasized that she only posts about topics that further build her reputation and only works in groups that can help her enhance her association with particular areas of expertise. She noted, "[The System] helps you build a reputation, build your brand, and showing that you are good in this particular area." Another respondent stated, "If you want to build your reputation, you could keep blogging about personal successes and expertise and build your own personal brand, then they will see who it is. I will blog more about certain areas of expertise to try and maintain their [coworkers] attention."

The interviews further suggested that this self-promotion behavior in the system was not only prevalent but also intentional. One user indicated that system users "should be sharing success stories" as a part of their contributions on the system. It also may have been regarded as a normative expectation of system use. One respondent noted, "I do not post very often on [Inspire], but when I do post, I only share content related to [area of expertise], which is my area of expertise and I want that to be my personal brand on [Inspire]. I want people to know that I am the expert on [area of expertise]." Similarly, another respondent argued that she thinks people should self-promote given the global and distributed nature of the organization, suggesting: "I think we need to build more visibility, and it's really out of sight, out of mind concept when you're working in the global environment. Sometimes if you're silent people sort of forget you exist." She continued by reflecting that this mindset is not unique but widely shared in the company: "I think that most of the people here truly must have a similar mindset when they go into [Inspire], when they start posting stuff, it's relevant and they're trying to build their brand into something nice." Thus, the desire to have a well-defined personal brand, to be visible, and to get noticed inside the organization underpins users' frequent posting behavior.

Interestingly, this self-promotional behavior not only influences what content the super-promoter contributes but also affects who they follow as well their viewing behaviors, which results in the second most frequently reported usage behaviors by super-promoters—networking. The system allows users to "follow" content by particular contributors. Self-identified promoters often chose which users to follow based on the opportunity it provided for further self-promotion. One respondent noted: "Honestly speaking, I follow to keep up appearances … but I don't actively read their content." Hence, self-promotion stems not only from posting content that contributes to one's own brand but also from becoming associated with certain influential groups in the organizations or certain topics that further assist the purpose of creating a strong personal brand.

Yet, in light of all the self-promotional content shared, their overall behavior pattern raises an interesting question. Does it have the reputation effects that the contributors believe it does? Our qualitative data provided mixed results on this question. Some respondents firmly believed that these contributions were efficacious. Although recognizing that many employees are not active in terms of posting in the system, one respondent insisted that "people look at it, and they do follow it, so it is relevant to building your brand!" Similarly, one of the respondents mentioned: "I've had like, a couple of like, people who look at it which, that you know,

okay, so these are the kind of people I do want to have attention now, and so, I wanna keep doing it again." Another respondent said, "I view [Inspire] as a place full of opportunities, that I could never do in real life because we just don't meet each other. It let me at the end of the day to give a presentation in front of like a lot of senior managers, which I never thought I would," offering further evidence that (some of) the self-presentational activities may be worthwhile in terms of improving the individual's overall visibility inside the organization.

Promoters (Community-minded). In addition to their quantitative differences—primarily in terms of the number of posting behaviors—the qualitative description of usage behaviors by promoters shows some similarities but also important distinctions. Similar to super-promoters, the most salient usage behavior of promoters can best be described as personal reputation building. Like super-promoters, promoters also describe the benefits of the system in terms of building a brand.

> So, I'm building my brand. I'm trying to do a lot of knowledge management. So I'm trying to build up that knowledge brand so that people know that I'm interested in it. And, yeah. Because people do look in [Inspire] and if you have really interesting articles it gets posted on the first page. So, they read article and then they will see who it is.

Hence, promoters realize the usefulness of Inspire for creating awareness for one's own professional and personal interests, as follows: "[The System] makes it very easy for me through this blog feature to showcase some of my professional work and projects I'm working on as well as some personal topics."

However, beyond enhancing one's individual visibility, promoters also emphasize the role Inspire plays in creating awareness for their teams by building a team reputation—the second most frequently mentioned activity. Hence, unlike super-promoters, their promotional behavior does not focus solely on individual gain but also on benefits for the team. Here, the main reason is representational,[3] that is, to raise awareness for the team and the types of projects the team is engaged in. "People that normally don't even know us as a team, or are not that familiar with us as a department, can read that and then get a better idea of what we do, or our role and what we do as a team. I think that it's great that way." Similarly, other promoters mentioned how "[the System]'s a good way, if we post up a blog post about one of the topics that we've been working on" as well as for "sharing success stories" about the team. Therefore, unlike super-promoters, promoters do not merely share their own personal successes, but also share successes about their teams to raise awareness for the team and its projects.

Core Users. The third user group, the core users, displayed a sharp contrast in user behaviors compared to both super-promoters and promoters. First, the respondent mentions that Inspire helps facilitate the sharing of ideas and information —"allowing free flows of ideas and information"—which "provides strong opportunities for open innovation." Consequently, "on Inspire, innovation happens across the company between people from multiple places, multiple time zones that share

similarities" and that leveraging Inspire for innovation purposes can "only help move us more quickly" toward client solutions. These open flows of knowledge and ideas through Inspire further help avoid being "too siloed in what you do so you will end up repeating research that's already been done."

Second, the core user respondent mentioned that Inspire allows him to engage in project work. The core user mentioned creating and coordinating "project spaces [that] are closed to protect the project information until there is a deliverable" and to leverage Inspire to support group discussions primarily in the context of highly distributed teams "because the members [of my team] are so distributed it is more effective to have a discussion on the [System]." Thus, the system provides them a more effective way to engage in project work particularly in the context of highly distributed teams.

Thus, overall core users are more concerned with using Inspire to support work activities, ranging from innovation to project coordination rather than using it for self-promotional or recreational activities. Indeed, the respondent rejected use of the system for sharing personal information, mentioning: "I recently saw an announcement—'just finished my Jimmy John's sandwich and am getting back to work'—and I don't think this is how it [Inspire] should function. I don't have that kind of time to spend on reading this type of information."

Periphery Users. The fourth user group, the periphery users, mention three distinct usage behaviors, all of which further underscore their largely passive usage of Inspire focusing "around consuming [rather] than producing." Indeed, all peripheral respondents made remarks signifying their passive use as follows. "I normally read those posts and then read comments by people, but I normally don't contribute that much. I'm more of a consumer than a producer of things on [Inspire]." Similarly, another respondent noted, "I am more often a consumer of the social media than a contributor."

In terms of specific usage behaviors, the most salient activity could best be described as reading news in order to stay connected. Many of the periphery users are actually also peripheral employees of the company who reside in peripheral locations and consequently feel less connected to the company. As a result, their most salient usage behavior focuses on reading corporate news that makes them feel connected to the company. By allowing them to keep up with news about the corporate headquarters, Inspire helps them "feel like you're part of the company" by giving "a little idea of what's going on" in these more central locations. Their passive consumption behavior is thus largely driven by their geographic isolation: "I check [Inspire] every couple of days just because I feel like we are geographically isolated, and [the Company] is very headquarters-centric."

The second most frequent use of Inspire by periphery users can best be described as looking up people, another passive usage behavior. Similar to staying in touch with central locations, peripheral users also mentioned that Inspire was useful in terms of "looking up people," and this was further emphasized by another respondent, who noted, "The better things about it, like I said, finding the people online and being able to know something about them, that is nice." Another periphery user

mentioned, "And I'm a little too consumed with my work … so I don't really gravitate towards [Inspire] for any particular reason other than to look up people." Many of the periphery users emphasized that looking up people is primarily useful prior to meeting someone face-to-face for the first time and therefore is probably a direct result from the fact that the majority of periphery users describe themselves as introverts and "just a little shy."

Interestingly, periphery users' passive consumption and general lack of active contribution seems to be rooted in multiple reasons, the most salient of which is probably the abundance of self-promotional behavior. One of the periphery users, who is a remote worker, criticized how the system was primarily used by people to write about their "own successes and big sales wins." She argued that she had largely abandoned the use of Inspire due to the lack of engaging content and the abundance of self-promotional content. Lack of engaging content was frequently mentioned by periphery users in explaining their lack of engagement with Inspire arguing, "When does it just become a [Company] Facebook for advancing yourself as opposed to a means for advancing the corporation." Other interesting themes that could potentially explain the lack of active contributions pertain to cultural norms and personality traits. For instance, several of them mentioned that "at least here in Asia, there's kind of that whole thing about you don't wanna spend too much time socializing at work." Similarly, one respondent mentioned how she and her Asian colleagues were more likely to "be just consumers of information on [Inspire]." She followed up by saying: "Again, it goes back to the whole Asian culture thing where you're like 'I don't know whether what I'm doing is significant.'" Similarly, two of the North American periphery users briefly mentioned their introverted personality as a reason for consuming rather than participating. Thus, periphery users' consumption behaviors seem to be a direct consequence of the strong presence of super-promoters and regular promoters in Inspire combined with distinct cultural norms and personality traits.

The results of qualitative data analysis provided further evidence for the existence of core-periphery users in ESM communities. Additionally, while our cluster analysis identified new groups of users who contributed more content than they viewed, sometimes considerably more content, our qualitative data suggested that the purpose of this contribution pattern was to promote one's reputation within the company. Thus, these two sources of data taken together provide compelling evidence in support of the existence of a user type—the promoters—in addition to core-periphery users that are well established in the literature.

The Roles of Group Characteristics in Users' Contribution Behaviors

The second phase included analyses of system log data to understand the contribution tendencies of the identified user classes in different communities of Inspire by conducting multilevel regression analyses. We explored whether the promoter and super-promoters contributed to qualitatively different types of groups than did users with contribution patterns that were similar to traditional online community

behaviors. To test this question, we analyzed 3,116 blog posts by 359 users in 363 groups using a generalized linear mixed effects regression (GLMER) to examine the effects of individual and group-level variables (see Table 4) on posting activity and test our hypotheses. Both dependent and independent variables come from organizational records that are collected using the system log data of the identified system.

Dependent Variable: We examined an ESM user's information posting behavior as the main dependent variable of interest, which is operationalized as a continuous variable at the individual level. The variable reflects how frequently an individual user writes a blog post in a given group space.

Individual-Level Variables: We examined the user classes as one of the key independent variables of interest, which is operationalized as a dichotomous variable. Utilizing cluster analysis, user classes are formed by examining users' posting behaviors in terms of posting and viewing across the system (i.e., activities spanning both individual and group blogs).

Group-Level Variables: We utilized group visibility and group size as two key group-level independent variables to test the hypotheses of our study, both of which were measured unobtrusively through the log data of Inspire. Group visibility is operationalized as a dichotomous variable reflecting the existing privacy settings of the group afforded to users by the system. We focus on two extremes—open versus closed groups—indicating whether the content of the group is visible to users who do not belong to that group, that is, to nonmembers of the group.

Group size is a dichotomous indicator inferred from the log data, reflecting the total number of members associated with a group. We obtained group size for each group under examination and then split the data based on the group size mean, shifting the group size scale to a binary variable such that a group that has less than 36 members equaled 0, indicating small groups, and groups with more than 36 members equaled 1, indicating large groups. Dichotomization of group size was performed for three reasons. First, dichotomization reduces the influence of outliers

Table 4: Variables of Interest to Specify the Research Model

Variable		Variable level	Variable type	Definition
Posting	DV	Individual	Continuous	The number of posts by a user in a group
User Class	IV	Individual	Dichotomous	(1 = core users, 2 = super-promoters, 3 = promoters, 4 = periphery users).
Group Visibility	IV	Group	Dichotomous	Whether the group content is open or closed to others (0 = open, 1 = closed).
Group Size	IV	Group	Dichotomous	The size of a group in membership count (0 = Small groups, count < 36; 1 = Large groups)

in data analysis; since group size was characterized by several extreme outliers due to the unobtrusive nature of our data [20]. Second, the two categories of group size that emerged from dichotomization—small versus large groups—displayed extremely narrow confidence intervals, therefore indicating limited variability within each group, small versus large, underscoring the acceptability of dichotomization. Third, given that the other variables in our regression model were categorical, the dichotomization of group size facilitated the modeling of the interaction effects and the presentation of results.

In line with H1 and H2, we expect that controlling for individual differences, group visibility and group size will play key roles in shaping the rate of posting for different user classes. Descriptive statistics for group visibility and group size are presented in Table 5.

Model Specification and Results of Multilevel Regression: Data were entered into Excel and then imported into the LME4 statistical package in R for analysis. R was preferred because of its ability to support multilevel regression analysis. A key consideration in the data is that most users posted multiple blog posts, while also being members of multiple groups. Furthermore, most groups contained multiple blog posts; hence, all these data characteristics violate the independence of errors assumption of standard linear regression models. To remedy this situation and correct this multilevel clustering of data in the model, we utilized the mixed effects regression approach and included random intercepts for both users and groups.

Y_{ug} (the number of posts by an individual user u in a group g) was examined as the key dependent variable. Since Y_{ug} is a count variable, it is heteroskedastic (i.e., its variance is not constant but depends on the value of the estimate itself) and bounded by zero. To remedy this situation, we used the generalized regression approach, and modeled the dependent variable as a Poisson-distributed variable. As per our hypotheses, the independent variables were both individual-level (i.e., user classes) and group-level (i.e., group visibility and size). We first examined the main effects of both levels and then ran an overall model to observe the interaction effects of user classes with group-level variables. As presented in the cluster analysis, user class has four values: core users, super-promoters, promoters, and periphery users. In the regression model, the cluster of core users is taken as the baseline cluster and the other three clusters were included as independent variables as specified below:

Table 5: Descriptive Statistics for Group Visibility and Group Size

	Small groups	Large groups	Open groups	Closed groups
Posting	Average: 4.36 Lower bound: 3.45 Upper bound: 5.26	Average: 18.34 Lower bound: 11.22 Upper bound: 25.46	Average: 10.97 Lower bound: 7.50 Upper bound: 14.44	Average: 4.18 Lower bound: 2.99 Upper bound: 5.37

Baseline: Core users
X_{spro}: Super-promoters (1 for super-promoters and 0 for all other clusters),
X_{prom}: Promoters (1 for promoters and 0 for all other clusters),
X_{pasv}: Periphery users (1 for periphery users and 0 for all other clusters).

Group visibility has two values (open and closed). We specified open as the baseline condition and included X_{sec} (1 for closed groups and 0 for open groups) as an independent variable in the regression model. Group size also has two values that are small (group with fewer than 36 members, $N_{small} = 173$) and large (with 36 or more members, $N_{large} = 190$). In the regression model, small is taken as the baseline condition and X_{lg} (1 for large groups and 0 for small groups) is included as an independent variable.

Given these baseline conditions, the following regression equation is proposed where β are the regression estimates and where the random intercepts for each of the levels of individual user and group respectively—$b_u \sim N(0, \sigma_u)$, $b_g \sim N(0, \sigma_g)$—and error term—$\varepsilon \sim N(0, \sigma_Y)$—are assumed to be independent normally distributed random variables.

$$\begin{aligned}\ln(Y_{ug}) = {} & \alpha + \beta_{spro}X_{spro} + \beta_{prom}X_{prom} + \beta_{pasv}X_{pasv} + \beta_{sec}X_{sec} \\ & + \beta_{lg}X_{lg} + \beta_{spro:sec}X_{spro}X_{sec} + \beta_{prom:sec}X_{prom}X_{sec} + \beta_{pasv:sec}X_{pasv}X_{sec} \\ & + \beta_{spro:lg}X_{spro}X_{lg} + \beta_{prom:lg}X_{prom}X_{lg} + \beta_{pasv:lg}X_{pasv}X_{lg} + b_u + b_g + \varepsilon\end{aligned}$$

The results of the analysis of variance (ANOVA) test in relation to a user's rate of posting within a group are presented in Table 6. The results show that although user class and group size display significant main effects on the rate of posting, group visibility does not. The interaction effects of both of the hypothesized interactions—User Class × Group Visibility ($F = 4.55$, $p < .003$) and User Class × Group Size ($F = 63.24$, $p < .001$)—on posting are significant, indicating that users of different clusters have different rates of posting in groups with different group visibility and group size.

To explore these relationships further and test the proposed hypotheses, we closely examine each of the possible combinations of the proposed interactions. We present the coefficients of the GLMER model in Table 7. To aid interpretation of the analysis, we include exp(β), which represents the rate ratio of the presented effect against its baseline. For example, exp(β_{sec}) estimates how many times higher (or lower, in case of

Table 6: ANOVA Results

	Df	Sum aq.	*F*-value	*p*-value
User Class	3	93.466	31.155	< .001
Group Visibility	1	0.761	0.761	.383
Group Size	1	3.822	3.822	<.051
User Class × Group Visibility	3	13.651	4.550	<.003
User Class × Group Size	3	189.724	63.241	< .001

Table 7: The Coefficients of the GLMER Model

	exp(β)	β	S.E.	*z*-value	*p*-value
exp(α): Intercept	0.0197	–3.93	0.548	–7.162	< .001
User Class					
X_{spro}: super-promoters	80.6	4.39	0.596	7.372	< .001
X_{prom}: promoters	6.87	1.93	0.539	3.580	< .001
X_{pasv}: periphery users	1.530	0.43	0.561	0.758	.448
Group Visibility					
X_{sec}: closed	4.98	1.61	0.343	4.679	< .001
Group Size					
X_{lg}: large	14.2	2.66	0.358	7.420	< .001
User Class × Group Visibility					
$X_{spro}X_{sec}$: super-promoters: closed	0.121	–2.11	0.311	–6.804	< .001
$X_{prom}X_{sec}$: promoters: closed	0.217	–1.53	0.292	–5.230	< .001
$X_{pasv}X_{sec}$: periphery users: closed	0.385	–0.95	0.292	–3.262	< .001
User Class × Group Size					
$X_{spro}X_{lg}$: super-promoters: large	0.0231	–3.77	0.285	–13.223	< .001
$X_{prom}X_{lg}$: promoters: large	0.0242	–3.72	0.283	–13.143	< .001
$X_{pasv}X_{lg}$: periphery users: large	0.0520	–2.96	0.294	–10.066	< .001

a value smaller than zero) the rate of posting in closed groups is compared to open groups. Given the regression model, this effect is conditional upon size (i.e., it holds for groups of the same size only) and it interacts with cluster: β_{sec} represents the effect of group visibility for core users only. For periphery users, for instance, the effect of group visibility is $\beta_{sec} + \beta_{pasv:sec}$ (and the rate ratio is $exp[\beta_{sec} + \beta_{pasv:sec}]$). In effect, $\beta_{pasv:sec}$ represents the *difference* in the effect of group visibility between core users and periphery users (and $\exp[\beta_{pasv:sec}]$), that is, how much higher or lower the posting rate ratio of group type for periphery users is compared to the rate ratio of group type for super-users. Finally, exp(α) represents the rate of posting in the baseline condition (i.e., the rate of posting of core users in small, open groups). Other rates can be calculated, for example, the rate of posting of super-promoters in large, closed groups is $\exp(\alpha + \beta_{spro}X_{spro} + \beta_{sec}X_{sec} + \beta_{lg}X_{lg} + \beta_{spro:sec}X_{spro}X_{sec} + \beta_{spro:lg}X_{spro}X_{lg})$.

The rate of posting of core users in the baseline condition—small, open groups—is very low. This baseline condition is presented in the first row of Table 7 as the intercept (i.e., exp[β]), indicating that there are 0.0197 posts per user per group for core users in small and open groups. In the same baseline condition, the rate of posting is 80.6 times higher for super-promoters, 6.87 times higher for promoters, and 1.53 times higher for periphery users.

User Class × Group Visibility interaction: We initially conceptualized H1a based on our assumption that we would retrieve a general user class of promoters. However, the results of the cluster analysis provided us with two distinct categories of promoters: super-promoters and promoters. The results show that, as predicted, super-promoters blog significantly more in open groups than in closed groups. The rate of posting in closed groups is 39.3 percent less

(rate ratio: exp[1.61 – 2.11] = 0.607) for super-promoters, partially validating H1a. Our hypothesis holds for super-promoters only as the results show that there is no significant difference in terms of rate of posting in open versus closed groups for promoters. We also found empirical evidence for H1b and H1c. As predicted, both core users and periphery users blog significantly more in closed groups than in open groups. The rate of posting in closed groups is 4.98 percent more for core users and 93.5 percent more for periphery users than in open groups.

User Class × Group Size interaction: H2 suggests that group size is an additional predictor of a user class's activity within that group, such that while promoters prefer to contribute in small groups, core users and periphery users prefer large groups. The results show that, as predicted both super-promoters and promoters blog significantly less in large groups than in small groups: 3.03 times less for super-promoters with rate ratio: exp(2.66 – 3.77) = 0.330, and 2.89 times less for promoters, confirming H2a. Core users blog 14.2 times more in large groups than in small groups, confirming H2b. However, we observe that periphery users blog at about the same rate across both small and large groups, not supporting H2c.

The effects of Group Visibility and Group Size are additive, such that in large, closed groups, core users blog at a rate of exp(–3.93 + 1.61 + 2.66) = 1.40 posts per user per group. Super-promoters blog 4.44 times less than core users—rate ratio: exp (4.39 – 2.11 – 3.77) = 0.225; promoters blog 27.7 times less than core users, and periphery users blog 32.5 times less than super-users in the context of large, closed groups. The results are summarized in Table 8.

Table 8: Summary of the Results

Hypothesis	Result	Findings
H1a	Partially supported	Super-promoters are more likely to contribute to open groups rather than closed groups. Group visibility is not a significant predictor of contributions for promoters.
H1b	Supported	Core users are more likely to contribute to closed groups rather than open groups.
H1c	Supported	Periphery-users are more likely to contribute to closed rather than open groups.
H2a	Supported	Super-promoters and promoters contribute more in small rather than large groups.
H2b	Supported	Core users contribute more in large groups rather than small groups.
H2c	Not supported	Group size is not a significant predictor of contributions for periphery users.

Discussion

This study theorizes that, in addition to the core and peripheral users who exist in traditional online communities, ESM communities encompass another class of users who display distinct usage behavior in terms of their rate of information contribution and consumption. Specifically, we theorized a new group of users who contribute significantly more information than they consume. Not only did our empirical analysis validate the existence of this group of users, it also exhibited characteristics of participation inequality much like more traditional community roles. We label these users promoters and super-promoters.

We then examined the roles of individual dispositions for participation and group characteristics in predicting users' posting behavior in an ESM community. Taking the cluster a user is associated with as a proxy of his or her disposition for participation, we showed that individual dispositions are significantly related to an individual's posting behavior in an ESM community. As predicted, both core users and promoters displayed higher levels of posting behavior than periphery users within a group. Results also indicated that user classes show significantly different preferences for posting to different types of groups. Super-promoters preferred small and/or open groups to maximize their visibility and audience, given that content is visible to the entire organization while restricting the number of competing voices, as they are likely to face less competition in the context of a group that has fewer posters. Core users preferred large and/or closed groups to maximize their reach and interaction within the community, while periphery users preferred closed groups to minimize their visibility.

Theoretical Contributions

These findings have several important implications for understanding the behaviors and motivations of different user groups in ESM. First, this study argues that existing theories of online communities, such as the theory of legitimate peripheral participation [53] or the reader-to-leader framework [70], which are grounded in theories of offline social movements [68], do not necessarily apply to certain types of online communities in the enterprise setting. Specifically, the existence of this distinct class of users—the promoters—seems to be related to the visibility affordance characterizing ESM [55, 81] and the opportunities for selective self-presentation and self-promotion that emerge from enterprise use of these social media technologies [46, 79, 83]. Although ESM communities mirror online communities in terms of the existence of a small group of core users and a large mass of peripheral users, two additional user groups exist: the super-promoters and promoters. The existence of these two groups of users that behave differently from findings in previous literature [33], that is, they contribute more than they consume, significantly challenges the applicability of existing concepts and frameworks concerning online communities to the context of ESM communities.

The existence of these additional user groups seems to be a direct consequence of the visibility affordance characterizing ESM [55, 81] and the opportunities for selective self-presentation and self-promotion that emerge from the organizational use of social media technologies [46, 56, 83]. Although existing online communities literature has highlighted the importance of status-seeking and self-promoting behaviors in driving participation behaviors [38, 51, 57], participation models—as developed for traditional online communities—have not highlighted promoters as a distinct class of users that leverage the community platform primarily for self-promotion purposes.

Relatedly, identification of the super-promoters and promoters also points to the importance of analyzing consumption behaviors in addition to contribution behaviors. Studies of traditional online communities have inferred core and peripheral users through an analysis of contribution behaviors or the lack thereof, while black boxing their consumption behavior. That is, periphery users have been defined as the percentage of members that did not actively contribute (i.e., post) without actually measuring their consumption (i.e., viewing) behavior. This study, through including consumption behaviors as one variable in generating user classes, allowed the emergence of the super-promoters and promoters as distinct user groups that would not have been identified if only contribution behaviors had been measured. For instance, super-promoters and core users display roughly the same level of contribution behavior; however, the distinguishing factor is their consumption behavior, with the former reading existing content produced by others and the latter ignoring any content generated by other users.

Furthermore, the focus on consumption behaviors in addition to contribution behaviors further suggests a novel form of free ridership, which has less to do with whether or not people contribute to a community, and stems more from the extent to which users pay attention to and constructively utilize others' contributions in the community. A community can only thrive when there is a state of generalized reciprocity where users engage as much with the content created by others as they contribute novel information to the system themselves. In fact, findings from Hansen and Haas [35] reveal that the more information-scarce a knowledge market, the more the available information or knowledge gets leveraged. On the other hand, environments characterized by information abundance typically limit the extent to which available information gets used, thereby undermining the potential for duplication avoidance and recombinant innovation [54]. Although Hansen and Haas [35] suggested that underutilization of available information is a direct consequence of the lack of quality and focus characterizing information-abundant environments, our findings suggest that within the context of ESM this underutilization may be a consequence of the abundance of self-promoting users. The distinction between super-promoters and promoters points to an additional factor differentiating the ESM communities from the traditional online communities. Beyond the quantitative distinction between super-promoters and promoters—that is, the frequency of posting behaviors—there is an important qualitative difference, which is that the former group (i.e., super-promoters) focuses primarily on self-centered promotion, whereas

the latter group (i.e., promoters) focuses mostly on team-centered promotion. Although self-promotion and status seeking are motivations that have been identified for users of public online communities, the focus of promoters on representational activities that help to advance the reputation of the team they belong to [1, 2] is unique to organizational settings.

Our findings further surpass the individual-level focus that has dominated much of the ESM literature to date [5, 18] by identifying the complex interplays between individual users' disposition to participate in a community and the group-level characteristics of the community. Hence, rather than reducing contribution behavior to user preferences alone, we show that the extent of contribution by an individual user is the result of an intricate interaction between their participation disposition—as reflected in the user class—and group visibility and group size. This study thus presents a novel view of knowledge sharing, revealing how resource access is a multilevel phenomenon encompassing both individual sharing preferences and group characteristics. Hence, although individuals may display distinct sharing preferences, it is primarily the interactions with group visibility and group size that result in the materialization of contributions to the ESM community.

Finally, as aforementioned, our finding that the majority of ESM users contribute rather than consume content is not only in sharp contrast to the participation inequality models proposed in the existing online communities literature, but is also in opposition to previous assertions from the knowledge management literature that people will be generally unwilling to contribute to knowledge-sharing platforms in an enterprise setting because it diminishes their value as employees [33]. This finding thus emphasizes the importance of understanding characteristics of the technology, as the primary distinction between novel ESM platforms and previous knowledge-sharing platforms is the unprecedented visibility afforded by the former [79]. That is, ESM's most distinguishing affordance [79] is the ability for anyone in the organization to see who contributed what to the system, thereby offering unparalleled opportunities for self-promotion. Hence, a further contribution of this study is not only that it highlights the different user groups that exist in enterprise settings, but also that it reveals how radically different usage behaviors emerge as a result of the affordances of ESM, characterized by increased visibility, vis-à-vis previous computer-mediated communication systems in the workplace that similarly aimed to foster increased knowledge sharing.

Managerial Contributions

This study has important implications for managers leading ESM and the groups within them. First, previous literature has assumed that the primary challenge of online communities would be encouraging users to contribute the knowledge that they possess, suggesting that users would free ride and only consume knowledge contributed by others. This literature suggested that the value of ESM to the firm would be limited due to a lack of contributors [33]. This study suggests that the opposite problem may also be salient, where users contribute content but do not use

the knowledge contributed by others—a danger that might be even more insidious for organizations. People contributing content of their own but not viewing that of others may lead to the illusion of a vibrant knowledge community without providing any real benefits for the organization. Although the increase in contributions may seem like a positive indication of employee involvement, large amounts of posting combined with limited viewing present a challenge to knowledge sharing. To enhance the value derived from the knowledge community for the organization, ESM leaders should consider how to utilize different user groups across the system. The leaders could potentially attract certain groups of users for different tasks to support the knowledge community; such as inviting core users for open innovation and building trust, super-promoters for word-of-mouth diffusion, promoters for drawing attention to successful team work.

Second, our findings indicate that closed groups in ESM most closely mirror the core-periphery structure of traditional online communities and encompass a limited number of promoters. Hence, with these closed groups, contributions seem to focus more on generating value for the group or organization as a whole, whereas open groups seem to be used as amplifiers for self-promotion. This may be related to the fact that open groups are too risky for sharing confidential information or early stage intellectual property. Rather, closed groups offer sufficient closure for robust information exchanges to occur. This finding thus challenges the "ideology of openness" [31] that has characterized much of the academic literature and practitioner attention to ESM to date, by revealing the only limited knowledge-sharing benefits of open groups. Hence, rather than encouraging visibility and openness, organizations appear to benefit from a more closed use of the functionalities afforded by ESM. Third, if closed groups are indeed the crux of knowledge development, this has important practical implications in the sense that it limits the opportunities for serendipitous and organization-wide knowledge sharing that ESM was intended to enable [55, 81]. This is further intensified by the strong preference of core users to contribute in closed groups.

Additionally, the vibrant nature of closed groups may be a further consequence of the vain self-promotion that arises in open groups. Hence, despite companies implementing ESM for creating opportunities for serendipitous encounters and enhancing collaboration potential [55, 81], the majority of users leverage the system for self-presentational and self-promotional activities. Hence, closed groups—in addition to being formed to avoid accidental knowledge spills—may also be an act by legitimate core and peripheral users to flee the self-promotional behaviors that dominate open group spaces.

Thus, to encourage the type of vibrant knowledge-sharing communities that most organizations desire with the introduction of an ESM platform, there is a need to provide greater support for closed groups that display legitimate, community-oriented activities, or to restrict the promotional behaviors dominating open spaces, so that these spaces can be leveraged for the types of serendipitous collaborations they were intended to spur. This further implies that designers should not merely focus on designing ESM that supports even greater visibility and openness, but rather understand the distinct strategic objectives that may be served by allowing users to manipulate the visibility settings of group spaces within these systems.

Limitations and Future Research

This study has limitations that may influence the generalizability of its findings and warrant further research. First, we conducted this research using data from an ESM system within a single organization. Additional research is necessary before the results can be generalized to other systems and organizations.

Second, this study presents a snapshot view of how individual user preferences and group settings collide vis-à-vis a user's contributions to ESM, despite our log data being longitudinal in nature. Hence, future research should explore the temporal effects of user type and group privacy settings and determine whether different types of groups may be leveraged at different stages of a community's life cycle. Third, the use of longitudinal methods could further help to validate whether extreme core-periphery structures [49] impede knowledge flow [60] in ESM communities. Thus, future research could explore whether and how newcomers in the context of an enterprise setting become socially accepted and included [53]. Fourth, although the study offers important insights into the empirical link between user type, group size, and sharing behaviors, longitudinal data are needed to establish the causal link between user type and group size. Although the findings here suggest that promoters prefer smaller groups, while core users prefer larger groups, the reverse causality is plausible. The presence of core users who both contribute and engage with existing information may well be an indication of a thriving ESM communities, thereby creating the potential to attract novel users who want to learn. On the other hand, groups encompassing self-promoting users and information may be less attractive to new incoming users, thereby limiting their potential for growth. Hence, only by using a longitudinal approach can we identify whether group size is either cause or effect in terms of the high level of contributions of core users in large groups.

Fifth, this study has identified the distinct behaviors and motivations between four user groups in ESM communities, where the majority of users were found to consume very little content, but contribute substantial amounts of content with the purpose of self-promotion. Future research could offer further validation of the self-promoting behaviors of super-promoters and promoters through the use of content analysis. Furthermore, future research should explore whether posting this type of self-promotional content has the desired effect, that is, whether it is actually resulting in enhanced visibility and reputation. This could be achieved by first looking at the amount of engagement that such self-promotional content generates in the enterprise social medium, and second by analyzing the centrality of these actors in their ESM communities and the network of the organization at large.

Finally, although our qualitative data are based on a geographically dispersed sample of users so as to obtain a better understanding of their motivations and usage behaviors, we did not explore other possible implications of geographic location and national culture. Therefore, it would be worthwhile to explore whether there are significant cultural differences in the level of self-promotion that occurs in the context of ESM. For instance, despite limitations associated with making generalizations based on national culture, it is important to note that Hofstede [40] highlighted that masculine cultures display a preference for achievement, heroism,

and assertiveness, whereas feminine cultures show a strong preference for modesty. Hence, important differences could be anticipated between employees from countries with masculine versus feminine cultures in the level of self-promotion they engage in, a theme that emerged only marginally in the interviews and would require further in-depth exploration. Additionally, using a core-periphery perspective, it is interesting to explore whether there are differences in the prevalence of self-promotion that occurs by employees located inside or outside of the U.S. headquarters of the company. In particular, peripheral employees—that is, those outside the U.S. headquarters—may feel a stronger need to self-promote in order to raise awareness for and justify the existence of these core locations. Beyond location information, job titles of individual users may provide additional predictors of the types of user groups someone is likely to be associated with. On the one hand, those at lower levels of the corporate hierarchy may be more motivated to climb up the corporate ladder resulting in promotional behaviors. On the other hand, those in senior positions may also be inclined to use promotional strategies as a way to legitimize their presence in the higher echelons of the organization. These questions are not only interesting to explore theoretically but also could have significant managerial implications.

Conclusion

Despite these limitations, this study makes significant contributions. In particular, it provides strong empirical evidence that ESM communities include four classes of users. Similar to traditional online communities, ESM communities encompass a core and a periphery; however, additionally, we identified two new classes of users, super-promoters and promoters who contribute rather than consume content. Furthermore, our findings show that ultimately an individual's sharing behavior is not the sole outcome of user type, but rather results from the intricate interaction between the sharing preferences of individual users, the visibility of groups, and group size. In conclusion, future research should be conducted to focus on theorizing the multilevel nature of individual user and group behaviors in ESM communities.

Supplemental File

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Notes

1. In the context of marketing research that involves clusters derived from demographic characteristics (e.g., gender, age, education).

2. Cohen's kappa is a statistical measure of interrater agreement and it is generally considered to be a more robust measure than simple percentage agreement because it takes into account the agreement occurring by chance. A Cohen's kappa coefficient of .71 is considered substantial agreement. The reported coefficient is a cumulative (omnibus) score computed across the three categories of the coding scheme—representation, coordination, and information search.

3. Ancona and Caldwell's [1] seminal work on team boundary-spanning behavior refers to team reputation building as representation.

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