From Physical to Digital: Investigating the Offline Drivers of the Online Use and Quality of Knowledge Exchange of an Intraorganizational Digital Collaborative Technology

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ABSTRACT

This study integrates social capital and social cognitive theories to empirically test the effects of employees' attitudes, normative expectations, and informal position targeting the organization as offline drivers of online digital platform use and quality of knowledge exchange. Our findings provide several contributions: (1) revealing the relationships between individual and contextual variables targeting the physical and virtual organizational contexts, (2) offering a nuanced understanding of offline drivers for digital platform use and knowledge exchange, and (3) identifying key predictors that managers can leverage to align employee behaviors with organizational goals.

MANAGERIAL RELEVANCE STATEMENT

This study underlines the need to pay attention to individual motivations to use and contribute to intra-organizational digital platforms as a function of the position of the individuals within the informal organizational network. Incentives may be needed that consider the reputational effect in the informal organization and the need of translating complex knowledge to be diffused online. After spending a significant amount of money, time and resources, managers usually tend to pressure employees to use and contribute to digital platforms even though participation is officially voluntary. This behavior, though common, is largely counterproductive as it affects the very rationale for their existence. Our results suggest that managers focus on the development of internalized norms related to learning and sharing behaviors as well as to the

outcome expectations related to digital platforms as positive motivational drivers of their use and quality of contributions. This can be achieved in several ways, e.g., by setting clear objectives and intrinsic rewards (such as badges and other forms of recognition) given to the contributors and users aligned to share values and behaviors.

In the past few decades, companies have experienced a notable surge in the adoption of digital technologies, specifically knowledge management systems, collaborative tools, and enterprise social media platforms. The incorporation of these digital technologies has emerged as a crucial imperative for contemporary businesses[1] [2]. Indeed, they have a great potential to foster business innovation and optimize work processes. Software and tools like Microsoft Yammer, Facebook Workplace, Sprout Social, Slack, Trello, and a plethora of proprietary or custom intranet-based instant messaging systems have increasingly become a staple in the workplace as they can centralize knowledge management, facilitate internal communication, socialization processes, and coordination among employees. A McKinsey Global Institute report highlighted how use of social enterprise technologies could boost productivity up to 25 % [3] and an MMR report forecasts a global market growth of 14% for the 2023-2029 period [4]. Enterprise social technologies integrate with multiple software suites that organizations widely employ, among others, for digital asset management (e.g., Dropbox, Canva), customer relationship management (e.g., HubSpot, Microsoft Dynamics 365, Salesforce), and customer experience management (e.g., ZenDesk). In sum, they improve workflow at the organizational level via empowering employees by leveraging flattened knowledge barriers in digital spaces.

Recent studies show that despite its importance, digital technology cannot be considered a driver of innovation *per se* [5], suggesting the need to delve into what type of digital technology and what type of individual and contextual factors might be responsible [6]–[8]. Therefore, understanding what drives individuals to use digital technologies in the workplace is particularly relevant to better managing people in the new hybrid work context that emerged after Covid [9].

In this study, we investigate the drivers affecting the use of an intra-organizational digital social platform. Specifically, we explore whether individual and contextual variables affecting

knowledge sharing within the physical organization translate into the use and quality of knowledge shared on an intra-organizational digital platform. In doing so, we recognize the role of digital technology as a potential enabler of organizational performance [10] through the critical importance of the knowledge therein shared [11] along with the individual motivation to participate [12]–[14]. When examining the realm of digital social platforms, it is notable that most studies within the information system (IS) and marketing literature have predominantly focused on investigating consumer participation within consumer virtual communities [15] or professional virtual communities [14]. Here we focus on intra-organizational digital collaborative platforms or Enterprise Social Media (see Leonardi, Huysman, and Steinfield [16] for a definition of ESM) as a relevant and less explored setting [17], [18]. These platforms have witnessed increasing adoption within organizations and necessitate substantial investment in terms of time, financial resources, and organizational design from adopting companies [19]. ESMs serve as essential organizational tools with the potential to impact a diverse range of outcomes, encompassing internal communication [20], knowledge exchange between employees [21], individual engagement in the company [22] and employee-related outcomes (as illustrated in meta-analytical studies [23]). Indeed, ESMs play a pivotal role in fostering digital networks that facilitate the flow of ideas, information exchange, and the cultivation of trust [24], ultimately fostering collaboration and innovation. [25]

In the field of organization and information science, prior research has examined the impact of ESM on innovation and individual outcomes [26]–[28] [29], [30]. However, there is a lack of research on the antecedents of ESM usage (see for an exception Engler and Alpar [31] and Ecklebe and Löffler [32]), particularly related to individual and contextual variables targeting the physical organization (for an exception, see Bala and Bhagwatwar [33] and Charoensukmongkol [29]). This

paucity hinders our understanding of ESM's effectiveness in facilitating knowledge exchange [7]. Additionally, previous research has primarily focused on single online communities (e.g., communities of practice [12]), neglecting the complexity of knowledge sharing within real organizational contexts. With this study we set out to address the question: What are the key individual and contextual drivers that shape the usage and the quality of knowledge shared on an intra-organizational digital platform?

Drawing on prior research that integrates social capital and social cognitive theories (e.g., [14]), we adapt and reinterpret these theories within our specific context. We explore two potential channels: face-to-face interactions and digital platform usage, aiming to enhance our understanding of the drivers impacting the use and quality of knowledge shared on an intra-organizational digital platform. We challenge the prevailing focus on the structural dimension of social capital [34] in virtual communities and argue for its primary development in the physical environment. We posit that the nature of informal network relationships and individuals' organizational positions impact knowledge quality and digital platform utilization, even when considering other dimensions like experience and expectations. Contrary to previous findings [15], we expect normative compliance to play a role in driving knowledge exchange on enterprise social digital platforms [35]. Further research is needed to explore and operationalize social capital construct in diverse contexts due to the limited and mixed results in the existing literature [14], [32].

Social cognitive theory [36] has similarly been employed to investigate the drivers of participation in virtual communities (e.g., [37], [38]). This research stream shows consistent findings related to

the role of self-efficacy in explaining participation in virtual community settings [37], [38] (see for a metanalytic account [39]) while mixed findings emerged about the role of outcome expectations. Only a limited number of studies has integrated social cognitive theory and social capital theories, highlighting the potential for additional research in this area [14]. This study delves into the role of personal outcome expectations about the physical organization while also controlling for community outcome expectations related to the enterprise social network, which are deemed more suitable for our specific research context.

As part of a larger research program within a design SME directly involved in the use and experimentation of an in-house proprietary ESM, we collected data encompassing various dimensions of the employee-job-company relationship, including employee utilization and experience with the ESM. For this study, the analysis was restricted to a population of 87 individuals categorized as white-collar employees who provided information on the development of informal relationships. We test our model on a sub-sample of 64 employees (73% response rate). This context was particularly well-suited for several reasons. First, studies focusing on SMEs are in general scant [40] , and to our knowledge, no study target employees' motivation to use an intra-organizational enterprise social network from the social capital and social cognitive perspective together [41]. Second, focusing social network studies in organizations with a smaller and well-identified sub-sample increases the possibility of collecting high-quality data [42]. Third, the context, the type, and motivation behind the development of the specific ESM were fundamental to enable the possibility of analyzing the spillover between contextual and individual variables targeting the physical organization on the motivation to use the online ESM [16], [43] (see for a similar argument on the need to differentiate the type of online community Dholakia et

al. [15]). The results of a seemingly unrelated regression analysis (SUR) showed the differential role of social capital, social cognitive variables, and contextual variables in affecting the quality of knowledge shared in the ESM and its frequency of use.

This paper makes several contributions. Firstly, it extends the nomological set of variables [29], [33] related to knowledge sharing from the "physical organization" to the virtual intra-organizational context. Secondly, it provides a nuanced view of the drivers of ESM use and quality perception [14] by considering the preexisting physical context [6]. Thirdly, it enhances the application of the social capital and outcome expectations framework, deepening our understanding of the channels influencing ESM use and intra-organizational social media quality.[6], [14]

**Hypotheses development**

This study departs from the acknowledgment that: "…few studies have examined key factors affecting online knowledge sharing in organizations," [18] and very few combine different theoretical perspectives [14], [32]. The majority of IS literature investigating the relationships between social capital and knowledge sharing through the use of different online digital platform has not paid enough attention to the fact that digital platforms, in the organizational context, are unlikely introduced in a vacuum of relationships (see for an exception Bala and Bhagwatwar [33]; Charoensukmongkol [29]). Conversely, both formal and informal relationships developed within an organizational context can influence online knowledge sharing, and further empirical examinations are needed, given the scant and inconclusive results in extant literature [14], [32], [44], [45]. While we recognize the important contribution of Chiu and colleagues [14], we also depart from their study by developing hypotheses related to how the social capital developed

within the physical organization may translate to online knowledge sharing. We also differentiate the role of personal expectations related to the beneficial impact on physical organizational dynamics and community-related expectations at the level of the digital platform in this process. Our model incorporates dimensions derived from both social capital and social cognitive theories, focusing on the physical organization. We investigate how these dimensions influence individual usage of the (ESM) platform and their perception of the quality of knowledge exchange on the online platform. Below we develop hypotheses related to the role of centrality in the informal organizational advice (i.e., Advice indegree centrality) and friendship networks (i.e., Friendship indegree centrality; social capital's structural dimensions), individual's degree of organizational identification (i.e., Organizational identification; social capital's relational dimension), individual's subjective norms related to other's expectations about the use of the ESM (i.e., Normative belief on knowledge sharing; social capital's cognitive dimension), and individual's personal outcome expectations related to knowledge sharing within the organization (i.e., Personal outcome expectation; social cognitive theory's dimension). Furthermore, we incorporate controls that directly target the online ESM platform. These include the individual's internalized norms of sharing within the ESM (i.e., Shared Vision; social capital's cognitive dimension). We also control for the expectations that contribute to the use and growth of the ESM (i.e., Community outcome expectations; social cognitive theory's dimension) and for the individual's fear of losing personal value as a consequence of knowledge sharing. Lastly, we control for demographic characteristics (such as age) as potential factors influencing the use and perception of the quality of knowledge shared within the online ESM platform. Figure 1 summarizes the conceptual model and the expected relationships.

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INSERT FIGURE 1 ABOUT HERE

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***Social capital within the organization and online knowledge sharing.***

Several reviews have established the importance of social capital research in explaining different outcomes, across different level of analysis, and in different fields while also highlighting the different conceptualizations and operationalizations therein applied [46]. We draw upon the broader conceptualization of social capital proposed by Adler and Kwon [47] as the goodwill available to individuals or groups derived from the structure and content of an actor's social relations to move beyond the most common structural approach to the study of social capital [39], [48]. We thus use the tripartite framework proposed by Nahapiet and Ghoshal [34] considering social capital as composed by a structural, social, and cognitive dimension.

The relevance of this framework stems from the acknowledgement that the field of knowledge management and its information technology approach [49] (that has become dominant) still focuses on the extensive codification of (explicit) organizational knowledge at the expense of social mechanisms in the knowledge process [50]. Additionally, studies under the social capital framework share the basic assumption that access to resources embedded in the network may influence the capacity of actors to search, access, transfer, absorb and apply knowledge [34], [51] (see for a review Phelps, Heidl & Wadhwa [52]), beside other benefits such as visibility, influence, power, reputation, social support [47], [53]–[55]. However, less attention has been paid to the analysis of the direct relationship between the properties of social capital and knowledge sharing in the organizational field and particularly at the interpersonal level [52], [56].

Finally, the most relevant studies in the IS literature mostly consider the structural dimension operationalized as an impersonal form of social capital [32], [39] (for exceptions see Chiu et al., [14]; Chua et al. [57], Wasko and Faraj [12]) and in the context of the internet (see for a recent review of empirical studies Ecklebe and Löffler [32]). In the following sections we delve into each of the three dimensions [34] and its relationship with individuals' online knowledge sharing.

*Structural social capital*

The structural dimension of social capital refers to overall patterns of connections between individuals and focuses on the location that an actor occupies in the social structure [58]. In the social network literature, employee network centrality is one of the most studied structural characteristics [59]. A growing body of studies show that having a central network position is positively correlated to knowledge sharing behaviours [60] [61] [62] [56] [59], [63]. Indeed, actors who hold a central position in the network have more opportunities to share their knowledge and are therefore more likely to engage in said behaviours [56], [60], [63]. Their extent is also increased thanks to the accumulation of work-related knowledge [59] [60]. Within the structural approach, however, most studies have focused on instrumental [56], [61], [64] rather than expressive types of ties. Indeed, studies in the IS literature have paralleled the social network literature [14] with few considering both bonding and bridging ties as conducive to online knowledge exchange [32]. Other studies have focused on the effect of the use of social media in shaping the number of instrumental and affective ties when individuals are distant from each other [65] with very few exceptions in the organizational context [66]. However, structural social capital is generally operationalized as impersonal and therefore not capable of capturing the central idea of an individual's position within the social structure. In this study, we consider both types of ties and elaborate on the unique benefits provided to an individual occupying a central position in the networks

under study. Instrumental networks can manifest in various forms, including advice, political legitimacy, or task-related communication [36]. Typically, these networks are characterized by weak ties and lack reciprocation, serving as connections among diverse individuals [67]. Here, we focus on advice networks as our goal is to acknowledge the possibility that in real organizational contexts employees may have access to a variety of choices regarding the communication channels available to exchange knowledge (see for an exception, Di Gangi, Wasko, and Tang [43]). Centrality in the advice network best represents an individual's possibility to exchange work-related knowledge per se. Indeed, some studies have found that centrality is positively related to knowledge sharing [56], [59], [63] that is complex and tacit in nature [60], [61], [68], [69] (see for a review Phelps et al. [52]). Individuals occupying central positions in these networks will also be considered as reliable partners and therefore seen as attractive knowledge-sharing partners by others [56]. Overall, extant research shows a positive relationship between centrality in the informal social network and intra and inter-organizational knowledge exchange [52].

Along the same line, the IS literature has provided further evidence linking the structural dimension of social capital and knowledge sharing behaviours related to the use and quantity of knowledge employed [14], [31], [39]. Given the characteristics and benefits associated to being central in the informal advice network, we expect that:

*H1a: The greater the centrality of an individual within the advice network the greater will be her use of the intra organizational ESM.*

The existing IS literature provides limited evidence regarding the relationship between social interaction and the quality of knowledge exchange: previous studies [14] have demonstrated that the structural dimension of social interaction is not significantly associated with the quality of knowledge exchange within the online environment. The above-mentioned results should also be contextualized

based on the type of online social network platform and knowledge under examination. In our context, the ESM serves as an alternative and distinct environment for individuals to interact and exchange knowledge. This environment is characterized by a reduction in the richness that face-to-face exchanges typically offer, along with a greater emphasis on the codifiability of the exchanged knowledge (e.g., [31], [39]). Contrarily, existing evidence suggests that occupying a central position within the informal organizational network for advice is linked to enhanced reputation [56]. This reputation stems from the individual's capability to share complex and tacit knowledge [60], [61]. Individuals who are central in the informal organizational advice network may still engage in sharing knowledge within the ESM platform but consider the knowledge shared as less relevant, complete or accurate based on their experience and expectations. Therefore, given the different nature of knowledge exchange and type of processes expected in the informal organizational network vs the ESM, we anticipate a negative relationship between advice network centrality and the perception of the quality of knowledge exchanged on the intra-organizational ESM. Thus, we posit that:

*H1b: The greater the centrality of an individual within the advice network the lower the perceived quality of the knowledge exchange on intra organizational ESM.*

Affective ties are relationships that provide friendship, social and emotional support [67], [70], sense of belonging [71], interpersonal trust [57] and a sense of future obligation that eventually encourages reciprocity (a concept similar to bonding social capital, Putnam [72]). They are characterized by strong and frequent interactions [73], [74], connecting people who share similar characteristics [70]. Within the organizational literature friendship is a well-recognized phenomenon [75] affecting both individual and organizational outcomes [76], [77]. The inherent qualities provided by the friendship network [78] generate several outcomes, such as more time spent on elaborating and sharing information, fewer interpersonal risks, and greater reciprocity [69], [79], [80].

Furthermore, other correlational studies in the IS literature corroborate the expected positive relationship between friendship ties and the use of social networking sites, both on online platforms [14], [65]. In particular, social interaction captures the closeness and frequency of interaction, rather than solely the number of ties or an individual's position within the network. Moreover, similar findings have been observed within organizational settings, while other studies considered social capital as an outcome of the use of ESM [66], [81]. Additionally, the IS literature remains silent on the relationship between the quality of knowledge exchanged online and expressive ties. Nevertheless, the social network literature suggests that centrality in friendship networks will increase the likelihood to reciprocate and spend time in elaborating the knowledge to be shared [76]–[78]. ESM provide increased opportunities for individuals to connect with others, particularly those with whom they already share strong bonds within the organization, hence we expect that:

*H2a: The greater the centrality of an individual within the friendship network the greater will be her use of the intra organizational ESM.*

*H2b: The greater the centrality of an individual within the friendship network the higher the perceived quality of the knowledge exchange on the intra organizational ESM.*

*Relational social capital*

The relational dimension of social capital concerns the quality and content of the ties that link actors. The key dimensions of relational embeddedness may include interpersonal trust, identification of actors, solidarity and feelings of interpersonal relational proximity [34]. These dimensions are often inferred based on dyadic properties such as the frequency, intensity and reciprocity between two actors [47]. In this study, we focus on organizational identification for several reasons. First, trust and norms of reciprocity are developed through an individual’s ties within both advice and, especially, friendship

networks [47], [64], [69] [82]. These social dynamics are likely to positively influence the use of ESM. As suggested by Moran [82], it is the quality of an individual's relationship to determine the choice of partners to turn to, the possibility of receiving a response from and the effectiveness with which knowledge can be shared and exchanged. Second, studies using a social capital framework conceive trust and reciprocity as generalized within online platforms [14], [32], [66] with mixed results - either positive [12], [14], [83] or finding no significant relationship [14], [32], [84]. Third, studies under the social capital framework and social identity theory (e.g., Tajfel, [85]) show consistent evidence of the effect that being identified with or sharing a superordinate identity have on knowledge sharing behaviours [14], [86]–[89]. All these studies share the idea that social identification results in biases towards members of the social group one identifies with (in-group bias), thus affecting the cohesion among group members (e.g. Kramer [90]). The strong bond among members, resulting from their social identification, reduces the costs and uncertainties associated with seeking and sharing knowledge [34] [91]. Moreover, it enhances their willingness to cooperate [92], and actively engage in searching for, accepting, and providing knowledge to other organizational members [86], [88], [89] [92] . Following this line of reasoning we expect that:

*H3a: The higher an individual's organizational identification the greater will be her use of the intra organizational ESM.*

*H3b: The higher an individual's organizational identification the higher the perceived quality of the knowledge exchange on the intra organizational ESM.*

*Cognitive social capital*

The cognitive dimension of social capital refers to the set of resources that provide social actors with a system of meanings, representations, interpretations and shared languages [34]. The exchange of

knowledge and resources between two relational partners requires that they share, at least in part, languages, codes, interpretive schemes and a common knowledge base [58]. The cognitive dimension of social capital of individuals therefore influences both their ability to understand and assimilate the knowledge diffused within the organization and their ability to communicate and transfer their own knowledge - two essential conditions to effectively exercise knowledge exchange activities. In this study, we examine the perceptions of a shared vision at the online community level and normative pressure to share knowledge at the organization level as drivers of the use of the intra-organizational ESM and the quality of the knowledge therein shared. In fact, we can reasonably assume that given the small size of the company and its culture (i.e., a family-like environment) a relatively shared language is present. However, the interplay between internalized norms [93] and different expectations held by key individuals regarding knowledge sharing behaviours [94] becomes relevant due to the bottom-up and voluntary nature associated to ESM. Additionally, the potential normative pressure exerted by top management and peers further accentuates the importance of this interplay.

Indeed, while IS literature on internalized norms has already established a positive relationship with online knowledge sharing (e.g., [14], [15], [95]). However, studies examining the normative influence of others' expectations (i.e., subjective norms; [13], [94]) regarding online knowledge sharing behaviours have produced inconsistent findings. For example, Bagozzi and Dholakia [95] did not find any effect of compliance on the use of online social platforms while Engler and Alpar [31] found that peer influence had a positive effect on the intention to contribute content on an intranet platform. One of the reasons can be ascribed to the voluntary nature of contribution and the different type of online social platform and context. For example, Dholakia and colleagues [15] deemed the non-significant findings in Bagozzi and Dholakia [95] due to both the voluntary nature of the platform and that its members were anonymous. In the context of ESM, however, members are clearly identified so we expect that

compliance would exert greater pressure. At the same time, given the voluntary nature of the participation this pressure would create potential intra-personal conflicts reducing the motivation to participate while exerting a potential negative effect on the use. A possible way to reconcile these effects can be a reduction of use but an increase in quality, given the high visibility of the individual on the ESM and the general expectation to share knowledge. Overall, we expect that:

*H4a: The greater the normative influence of other's expectation on the individuals (Subjective Norms) the lower the use of the intra organizational ESM.*

*H4b: The greater the normative influence of other's expectation on the individuals (Subjective Norms) the higher the perceived quality of the knowledge exchange on intra organizational ESM.*

***Social Cognitive theory and online knowledge sharing.***

Social cognitive theory [36] has been widely used to investigate the drivers of participation in virtual communities [37], [38]. It postulates that two major types of a person's cognition outcome expectations and self-efficacy be considered as the main cognitive forces influencing individuals' behavior [36]. Within this literature, extant research shows consistent findings related to the role of self-efficacy in explaining participation in virtual community settings [37], [38] (see for a metanalytic account Nguyen et al. [96]) while mixed findings emerged about the role of outcome expectations. For example, Chiu and colleagues [14] and Tseng and Kuo [44] did not find a significant effect of personal outcome expectations on knowledge sharing while Lin and colleagues [97] and Chen and Hung [45] found a positive and significant relationship (see also Ecklebe and Löffler [32] in the context of ESM). Overall, these results may be driven by the different settings and operationalizations used in those studies, thus suggesting the need for further investigations. In this paper, following Chiu and colleagues [14], we explore the role of personal

outcome expectations pertaining to the physical organization, while controlling for the influence of community outcome expectations related to the ESM. By incorporating these dimensions, we aim to better align our study with the specific context under investigation. We expect personal outcome expectations for knowledge sharing within the company to be more influential than those for the ESM, as employees primarily identify with the offline community. However, the ESM may offer a distinct environment that can fulfill individuals' expectations. We thus hypothesize that:

*H5a: The greater an individual's personal outcome expectations, the greater the use of the intra organizational ESM.*

*H5b: The greater an individual's personal outcome expectations, the higher the perceived quality of the knowledge exchange on the intra-organizational ESM.*

## Methodology

### Context and sample

Data were collected in an SME design company as part of a research program aimed at understanding several aspects of the relationship between employees, their jobs, and their relationship with the company. This project was launched roughly one year after the introduction of an in-house ESM. The ESM was designed with three objectives: 1) to create a single place in an organic, strategic, and structured way where employees could work together and share skills and solutions (organizational goals); 2) to gradually improve all available solutions towards a single flexible, emerging, participatory and easy-to-use platform (technology goals); and 3) to broaden the active participation of all members of the organization, increasing their sensibility, transparency, and confidence with new ways of interacting (cultural goals). The in-house developed platform integrates social networks, personal blogs, instant messaging, discussion

forums, and tools for storing, retrieving, and updating documents, such as wikis and tags, all in a single space [16].

The focus was to highlight the increasing importance of internal stakeholders in generating and sharing company information, with the aim of gaining a competitive advantage through the bottom-up dissemination of knowledge and leveraging the organization's human capital. The primary goal was not solely economic advantage but rather the strategic enhancement and valorization of the company's human capital. The use of the platform was voluntary yet strongly encouraged by the company's top management. The latter was interested in assessing the experience related to the use of the ESM and to further motivate white-collar employees to use the platform. After a series of interviews with company key informants and in agreement with the ownership, still directly involved in the management of the company, an additional sociometric questionnaire was administered to all white-collar employees. The total headcount at the time of the study was 87. Sixty-four complete questionnaires were collected, resulting in a response rate of 73%. 13 questionnaires were dropped as names were omitted, rendering them not usable for our purposes, while ten individuals did not fill out the questionnaire because they were absent during the administration period or declined to participate. We further inspected the 13 questionnaires qualitatively and ran ANOVA tests by gender and age, finding no significant differences related to the use of the ESM and the perceived quality of knowledge shared on it. The final sample is composed of 36% women and 64% men with a seniority ranging between one month and 42 years (average of 6 years and 3 months with a std dev of 8 years and one month). Education-wise, the sample's population was distributed as follows: 9.4% graduated middle school[1], 50% graduated high school (almost exclusively trade and vocational schools), and the remaining 41.6% obtained

[1] While schooling is mandatory in Italy until grade 10 (approximately 16 years of age), parents can give consent to withdraw their children from schools at age 14 after graduating middle school (3 year cycle).

at least a college degree. Of those who graduated college or pursued further education, the majority obtained an engineering degree (24%), followed by architecture, industrial design, and political science all tied at 16%, foreign languages (12%), computer science (8%) and lastly business/economics and art history (4% each).

## Measures

All measures were taken or adapted from existing literature[2]. Wherever possible, we counterbalanced the measurement ordering of the predictor and criterion variables in the survey [98] and used different scale formats to alleviate common-method bias concerns [99]. Detailed demographic information, including gender, education, functional membership, and tenure was obtained from the individuals' responses and checked with the company's HR for individuals answering the sociometric part.

## Dependent variables

**Knowledge Quality**. The measure for the quality of the knowledge exchanged in the intra-organizational ESM was taken by Chiu and colleagues [14]. The six-item measure touches on several characteristics of the knowledge exchanged, such as accuracy and reliability, among others (Cronbach's alpha = .87).

**Use of the ESM**. We asked respondents to report their frequency of use of the ESM since its introduction (previous 12 months) on a seven-point scale ranging from "rarely" (once every three months) to "many times per day."

## Independent variables

[2] See appendix 1 for detailed items and factor loadings for each construct.

**Advice and Friendship network**. A sociometric questionnaire with a roster and free-choice format was administered to the white-collar population [51]. Respondents were provided with a complete directory of company employees divided by function and sorted alphabetically. Each employee had a unique code. For each network question, employees were instructed to indicate up to 20 preferences from that list and to use the corresponding personalized code to prevent errors and facilitate data entry. The network questions for this study were all recorded with a binary response scale and taken from Brass [100] to measure the advice network and from Ibarra [101] for the friendship network. We adopted indegree centrality as an appropriate indicator to capture various aspects, including structural social capital, individual visibility, popularity, and reputation [51], [102]. These factors play a crucial role in the mechanisms facilitating knowledge sharing. Additionally, there is ample evidence showing that individuals' centrality in their social environments has a great impact on their attitudes and behaviors [103] (for a meta-analytic account, see Brennecke and Stoemmer [102]). Therefore it can be considered a good proxy for the employees' opportunities to engage in knowledge sharing. Finally, all network measures were obtained using UCINET version 6.232 [104].

**Organizational identification**. According to Tajfel's [85] original definition and its later refinement (e.g., Ellemers, Kortekaas & Ouwerkerk [105]; Edwards [106]), we consider identification as a multidimensional concept comprising three distinct but related components, i.e., cognitive, evaluative, and emotional, which exert different effects on key outcome variables [105]. Of these three components, the emotional dimension has been shown to most clearly "supply the motivational force" leading to action or the "readiness to engage in or disengage from the interaction." As we are interested in organizational identification as a motivational force enabling knowledge exchange among organizational members, we define organizational identification as a member's sense of emotional involvement with the group [105]. We measured it using the items

advanced by Bagozzi and Lee [107] (Cronbach's alpha = .94).

**Normative beliefs on knowledge sharing (NOB).** We used three items proposed by Bock et al. [13]. A sample item was "My CEO thinks that I should share my knowledge with other members of the organization." Answers were recorded on a 7 points likert scale (Cronbach's alpha = .90.)

**Personal outcome expectations (POE)**. We adapted the six-item measure proposed by Chiu and colleagues [14] to target the physical organization and the expected benefits in terms of enriching knowledge, creating a sense of accomplishment, and make friends (Cronbach's alpha = .90)

**Control variables**

**Age**. We control for age as younger people may be more likely to share their knowledge to express themselves and get recognition (e.g., for career advancement purposes). Additionally, younger people are more likely to be familiar with technology and, therefore, might perceive the use of ESN as easier than older people. Conversely, older individuals may fear losing a competitive advantage if they share their knowledge [96]. Additionally, age usually correlates with tenure, signaling greater legitimacy and superior knowledge about the organization [108].

**Fear of losing one's own value (FEAR).** As trust is an important driver in knowledge sharing, we controlled for the fear of losing an individual's value due to sharing his/her knowledge. Extant research has demonstrated that this construct mediates the effect of trust in an organization's management toward knowledge sharing [109]. The items were taken from Renzl [109]. A sample of the items is "I don't gain anything if I share my know-how". The construct reached a good reliability with a Cronbach's alpha of .79.

**Knowledge sharing vision (KSV)**. Prior studies have already established a positive relationship between shared vision, conceived as internalized norms shared by the individual with other social group members [93], and online knowledge sharing [14], [15], [95] (see also Tsai and Goshal, 1998 [58] and Ecklebe and Löffler [32] for a recent review). Individuals are member both of the physical organization and of the online ESM, so we assess the level of an individual's shared vision of helping and learning in the context of the ESM (Cronbach's alpha = .89) using a three-item measure based on the scale proposed by Chiu and colleagues [14].

**Community outcome expectations (COE)**. Prior research has demonstrated that community outcome expectations, which pertain to the perceived usefulness of knowledge sharing and its role in fostering community growth and sustainability, positively influence both the utilization of the intra-organizational ESM and the quality of contributions [14], [110]. We employ the four-items proposed by Chiu and colleagues [14] (Cronbach's alpha = .92).

## Results

We tested our predictions using seemingly unrelated regression (i.e., SUR [111]) in STATA using the command *sureg*. Ordinary Least Squares (OLS) regression in which two or more dependent variables can be interrelated may have a bias in the estimates and their standard errors; hence an account for error covariance among the equations is needed [112]. In our model, SUR is necessary because the use of the ESM cannot be considered completely independent from the quality of the information and knowledge that can be found therein. SUR allows for the consideration of multiple models of correlations between variables [111]. Thus, given potential simultaneous relations, a SUR model is more appropriate than an OLS regression model. Finally, we checked for potential multi-collinearity among our variables by estimating the Variance Inflation Factor (VIF). Overall, the results were below conventionally

used rules of thumb that indicate excessive or serious multi-collinearity if any of the VIFs are greater than 10 [113].

Descriptive statistics including means, standard deviations, and minimum and maximum values for all variables, are presented in Table 1, along with constructs inter-correlations.

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INSERT TABLE 1 ABOUT HERE

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Table 2 shows the results of the SUR full models predicting individuals' use of the intra-organizational ESM and the quality of knowledge exchanged[3]. Model 1 shows results for the hypothesized relationships explaining individuals' use of the intra-organizational ESM. Looking at the control variables, the coefficients show a significant and negative effect of age (-0.08, $p <$ .001) while finding a positive and statistically significant effect of community outcome expectations targeting the ESM and its use (.61, $p < .001$). For the first set of hypotheses related to structural social capital at the organizational level with the use of the ESM, results show a significant and positive effect of having advice indegree centrality (.07, $p < .05$) while a positive but non-significant effect of friendship indegree centrality on the use of ESM. Therefore, H1a was confirmed while H2a was not. Individual organizational identification was found not to be significantly correlated with the use of ESM. Therefore, our H3a on the effect of relational social capital was rejected. Moving on to the hypotheses related to the cognitive dimension of social capital, we can state that H4a was confirmed as feeling pressure exerted by the top management and peers to share one's knowledge within the company had a negative and significant impact on the use of the ESM (-.41, $p < .001$). Finally, the coefficient related to an individual's personal

[3] For the sake of brevity we only report the full model. Stepwise model available upon request. Results of these models are nonetheless included in the manuscript and have informed our discussion.

outcome expectations (POE) targeting the company was positive and in line with the hypothesis but not significant. Therefore, we must reject H5a. Overall, the variables were able to explain 49% of the variance of Model 1 ($\chi^2 = 57.37$, $p < .001$).

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INSERT TABLE 2 ABOUT HERE

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Model 2 parallels Model 1 and shows the results for our hypotheses related to the impact of the same variables on the perceived quality of knowledge exchanged on the ESM. Looking at the control variables, we found a positive relationship between sharing a vision on knowledge exchange and learning in the ESM community and the quality of the knowledge exchanged (0.53, $p < .001$). We first considered the negative association between actors' structural social capital as represented by individuals' centrality in the advice network and the quality of knowledge exchanged on the ESM. The results in Model 2 provide support for the Hypothesis 1b (-.06, $p < .01$). Hypothesis 2b was also confirmed since indegree centrality in the friendship network was positive and significantly related to the quality of knowledge exchanged (.09, $p < .01$). Organizational identification did not exert any effect on the quality of knowledge on the ESM. Therefore, hypothesis 3b was not confirmed. With respect to the cognitive dimension of social capital, we expected a positive relationship between normative beliefs on knowledge sharing (NOB) and the quality of knowledge exchanged on the ESM. H4b was not confirmed since the coefficient was not statistically significant yet in the expected direction (0.12, $p = .127$). Personal and community outcome expectations did not affect the quality of knowledge exchanged on the intra-organizational ESM. Therefore, H5b was rejected. Finally, in this fully specified model, the

variables contribute up to 52% in explaining the quality of knowledge exchanged on the ESM ($\chi 2 = 65.1$, $p < .001$).

## DISCUSSION

Given the sharper acceleration in the implementation of digital technologies and the adoption of hybrid forms of work by companies around the globe, this study contributes to shed light on the factors affecting the use and the perception of quality of the knowledge exchange in ESM as a relevant and less explored context. More broadly, we contribute to a scant but emerging literature in IS (e.g., [29], [33]) suggesting that in addition to disposition, expectations and perceptions toward a new system, attention needs to be paid to individual and contextual factors unrelated to their implementation. Our first contribution relates to the extension of the nomological set of dispositional and contextual variables considered in previous studies by using a well-developed theoretical framework in IS. Prior research has looked at job satisfaction and/or organizational commitment as well as contextual factors such as coworker and supervisor support on the use of online social media like Facebook [29], and closer to our study, on the use and engagement with functional and enterprise system [33]. Further, we focused on variables that align with the specific characteristics of the digital technology being studied[33] particularly those closely related to the key function of an ESM: knowledge exchange and quality [7]. These variables were selected to capture individual outcomes that may translate into online behaviors. As a results, we showed for the first time, the connections and spillover effect from individual and contextual variables related to knowledge sharing targeting the "physical organization" to the virtual intra-organizational context. ESM are important tools for the creation of digital networks

promoting circulation of ideas, exchange of information, and development of trust [24] ultimately fostering collaboration and innovation [25].

Building upon established theoretical frameworks and prior research, we investigated the case of an intra-organizational social platform. This context considers individuals as members of both an offline community - the company - and a potential online community. Addressing this dual membership, we offer another contribution to the IS literature by providing a more refined and theoretical sound application of the social capital and outcomes expectation framework, customarily applied to study the drivers of online participation and knowledge exchange. Our results show (for the first time, to the best of our knowledge) the differential impact of individuals' structural capital built offline on both the use of, and the quality of knowledge exchanged in the ESM.

We advance previous studies by distinguishing between instrumental and affective relationships. In so doing, we depart from a view of "impersonal" closeness with the virtual community [14] [32] while offering a sounder operationalization of the structural dimension. Specifically, we corroborate previous results on the relationship between structural capital and knowledge exchange and extend them with those obtained for friendship network centrality. Contrary to what Chiu and colleague [14] reported, we found a positive and significant relationship between friendship indegree centrality and quality of knowledge exchange while not on the ESM use (see also Ecklebe and Loffler, 2022). This latter finding may be due to the fact that individuals within the organization can choose which channel to use to interact and exchange their knowledge. Given that friendship usually tends to privilege intimate and face-to-face types of interaction, it is not surprising that within an organization individuals may prefer a direct contact instead of a mediated one, unlike cases in which such possibility is not available [14], [65]. An alternative

explanation is that the ESM is not used with the aim of keeping in contact and intimacy as is the case for social media like Facebook. There we would expect a stronger and clear association [29]. Of peculiar interest is the interaction between the offline and online world within the company when advice network centrality is taken into account. Here, our results showed a conflictual view in which individuals' centrality fosters a sense of reciprocation and obligation that ESM can fulfil by offering more opportunities to interact with different organizational members [29]. However, social network literature suggests that the knowledge possessed by central individuals may be more complex and tacit in nature, thus requiring an effort that cannot be potentially balanced by the benefits of sharing. This, in turn, reduces the perception of the quality of the knowledge that can be exchanged on the ESN platform which often requires a more explicit articulation.

We did not find any effect of organizational identification on both dependent variables in our full specified model. This result parallels the non-significant relationships found by Bala and Bhagwatwar [33] between organizational commitment (i.e., a construct similar to the affective dimension of organizational identification used in the current study) and the use and engagement with the enterprise system. However, when included in the stepwise process, organizational identification positively and significantly affected the quality of knowledge exchanged. Again, the emotional bond with the organization translates into a need that can be potentially better satisfied offline or in a more complex way through the informal social relations developed within the company (see Monti and Soda, [114] for similar results and rationales). At the same time, it can offer a motivational boost to provide quality knowledge when the ESM is used.

Significant results are also related to cognitive social capital. Again, differences can be drawn when individuals compare their shared system of meanings and therefore behavioral expectations due to internalization or compliance pressure toward knowledge sharing and learning

within the organization. Norms related to sharing knowledge on the ESM have a positive effect on the quality but not on its use while previous results showed a positive effect on the intention and participation in virtual communities [15], [32], [95]. More interestingly, we found that experiencing high normative pressure to share knowledge may jeopardize ESM use and therefore one of the main drivers for its operational continuance. Previous research on online community participation [95] and intra-organizational social media [32] have found no relationship between the two variables due to the voluntary use of the systems. Our results emphasize the importance of considering contextual variables related to the physical organization when examining the use of digital technologies. It is crucial to account for the specificities of these technologies in order to gain a comprehensive understanding of their impact.

In our study outcome expectations targeting the ESM community seem to positively affect the use of the intra-organizational platform but not the quality (contrary to our prediction and previous findings[14]). Indeed, the results of personal outcome expectations showed no significant effect both on the use and quality of knowledge shared even when targeting the general organization as a referent point. A possible explanation relates to the fact that the type of outcomes expectations measured (such as happiness and emotional bond and reputation respectively) may not be achieved through the ESM or may already be satisfied by being central in the friendship or advice network. Finally, by confronting individual and contextual disposition targeting either the physical context or the specific ESM implemented in organization, we further our understanding of the different channels and their roles in affecting the use and the quality of intra-organizational social media.

Overall, this study offers an important contribution to our understanding of the complex process driving online knowledge sharing within organizations calling for the need to account for

important offline contextual variables that may affect the use and the quality of the knowledge exchanged on ESM. Furthermore, our study contributes by advocating for the integration of social network and social identity theories [114], [115]. Specifically, we examine the impact of both indegree centrality in different networks and organizational identification on two facets of online knowledge sharing. By doing so, we enhance the nomological validity and broaden the scope of outcome studies in this area.

From a managerial standpoint, three main aspects are worth highlighting. First, this study underlines the need to pay attention to individual motivations to use and contribute to intra-organizational ESM as a function of the position of the individuals within the informal social organization. This is an aspect largely overlooked by managers with a potential impact on the quality of the knowledge exchanged. Therefore, incentives may be needed that consider reputational effect in the informal organization and the need of translating complex knowledge to be diffused online. Conversely, fostering the possibility for employees to better know each other within the organization can increase the possibility of making friends, based, for example, on discovered similarities, ultimately affecting positively the quality of knowledge exchange on the ESM. After spending significant amount of money, time and resources, managers usually tend to pressure employees to use and contribute to ESM even though participation is officially voluntary. This behavior, though common, is largely counterproductive as it affects the very nature of the continuance and nature of ESM that is its use. Our results suggest that managers focus on the development of internalized norms related to learning and sharing behaviors as well as to the outcome expectations related to ESM as positive motivational drivers of its use and quality of contributions. This can be achieved in several ways, e.g. setting clear objectives and intrinsic

rewards (such as badges and other forms of recognition) given to the contributors and users aligned with shared values and encouraged behaviors.

**Limitations and future research**

The sample size and the focus on a sub-sample of the company certainly limit the generalizability of our results. However, given the nature of their work, white collar employees and managers are the target population more likely to use and benefit from ESM. Nevertheless, this study increases the ecological validity of previous studies targeting one member in multiple companies (e.g., Ecklebe and Löffler [32]). Given the study's correlational nature, future research is needed to establish the causality of the relationship using different research designs such as longitudinal, lagged, or experimental designs.

Future research should also focus on types of use on platforms such as contributing or consuming [31], the type of values researched [15] , and their relationship with centrality in different networks to account for possible substitution or enabler effects.

Overall, some of the non-significant patterns found in the study call for deeper analysis of the relationships between the variables under investigation to uncover substitution, interrelation, and mediation effects [58], [84]. With regards to outcome expectations, future studies may consider using different types of expectations more attuned to the context under scrutiny (i.e., the type of online platform) and replicate measures targeting both the physical organization and the virtual community in the case of ESM to better uncover the role of an individual’s identification with the organization and the ESM on the use and quality of knowledge exchanged [15].

FIGURE 1 Conceptual model

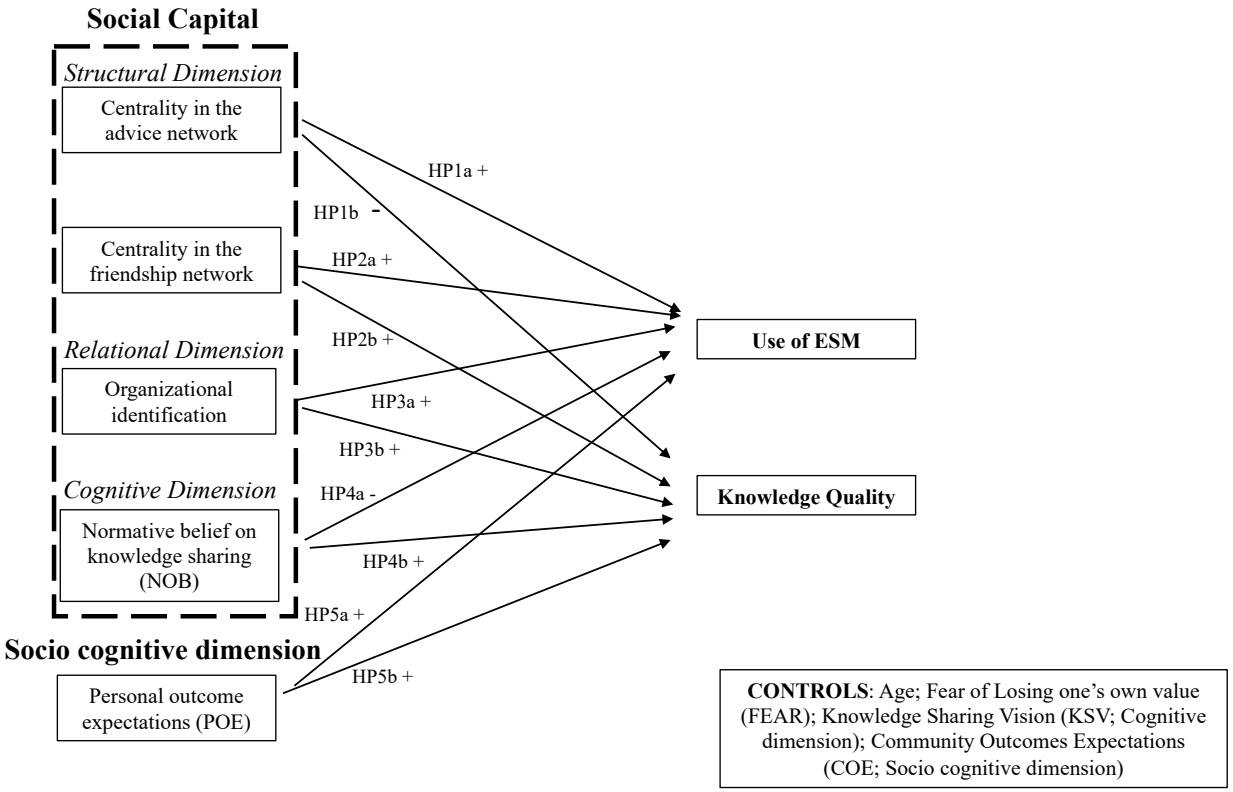

TABLE 1 Descriptive statistics including means, standard deviations, minimum and maximum value.

| Variable | Mean | Std. Dev | Min | Max | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Use of ESM | 5.403226 | 1.731669 | 1 | 7 | 1 | | | | | | | | | | |
| Knowledge Quality | 4.301587 | 1.037322 | 2 | 6 | 0.087 | 1 | | | | | | | | | |
| Friendship indegree centrality | 5.84375 | 4.321297 | 0 | 20 | 0.3494* | 0.0433 | 1 | | | | | | | | |
| Advice indegree centrality | 6 | 5.35709 | 0 | 23 | 0.0838 | -0.0473 | 0.0802 | 1 | | | | | | | |
| Organizational Identification | 5.15625 | 1.272028 | 1 | 7 | -0.1544 | 0.2545* | -0.4359* | 0.2108 | 1 | | | | | | |
| COE | 4.34127 | 1.411575 | 1 | 7 | 0.2589* | 0.2549* | -0.2128 | 0.2159 | 0.3216* | 1 | | | | | |
| POE | 4.950938 | 1.255975 | 1 | 7 | 0.0299 | 0.2006 | -0.2093 | 0.2827* | 0.3926* | 0.4732* | 1 | | | | |
| KSV | 4.275132 | 1.157088 | 1 | 7 | 0.1125 | 0.6061* | -0.1206 | 0.0979 | 0.2781* | 0.4032* | 0.1663 | 1 | | | |
| NOB | 4.952857 | 1.550606 | 1 | 7 | -0.2544* | 0.2867* | -0.3233* | 0.2737* | 0.3852* | 0.3324* | 0.3529* | 0.2121 | 1 | | |
| FEAR | 1.774219 | 0.8990291 | 1 | 5 | 0.2058 | -0.2103 | 0.0241 | -0.0892 | -0.2393 | 0.0313 | -0.2836* | -0.138 | -0.3061* | 1 | |
| Age | 34.57813 | 8.47743 | 23 | 59 | -0.3834* | 0.0624 | -0.4312* | 0.3562* | 0.4000* | 0.13 | 0.2497* | 0.0043 | 0.3019* | -0.1205 | 1 |
| Variable | Mean | Std. Dev | Min | Max | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

TABLE 2 Results of analyses for SUR Models 1 and 2

| | **Model 1** | | | **Model 2** | | |
|---|---|---|---|---|---|---|
| | **Use of ESM** | | | **Knowledge Quality** | | |
| | Und. Coeff. | Std. Err | P>\|z\| | Coeff. | Std. Err | P>\|z\| |
| ***Control variables*** | | | | | | |
| Age | **-0.08** | 0.02 | 0 | 0.02 | 0.01 | 0.191 |
| FEAR | 0.02 | 0.19 | 0.928 | -0.04 | 0.12 | 0.749 |
| KSV | 0.04 | 0.14 | 0.783 | **0.53** | 0.09 | 0 |
| COE | **0.61** | 0.14 | 0 | 0.03 | 0.09 | 0.746 |
| ***Independent variables*** | | | | | | |
| Friendship indegree centrality | 0.05 | 0.04 | 0.283 | **0.09** | 0.03 | 0.002 |
| Advice indegree centrality | **0.07** | 0.03 | 0.028 | **-0.06** | 0.02 | 0.008 |
| Organizational Identification | -0.07 | 0.15 | 0.644 | 0.09 | 0.09 | 0.316 |
| NOB | **-0.41** | 0.12 | 0.001 | 0.12 | 0.08 | 0.127 |
| POE | 0.03 | 0.15 | 0.851 | 0.06 | 0.10 | 0.521 |
| constant | 6.95 | 1.47 | 0 | -0.26 | 0.94 | 0.781 |
| R-squared | **0.49** | | | **0.52** | | |
| chi2 (P>chi2) | 57.37 (0.001) | | | 65.1(0.001) | | |

Note. Statistically significant coefficients in **bold**

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| Appendix 1. Items description, factor loadings and reliabilities of each latent construct in the conceptual model | | | |
|---|---|---|---|
| **Construct** | **Items description** | **Factor loadings** | **Cronbach alpha** |
| **Dependent and Independent variables** | | | |
| ***Knowledge quality (KQ)*** | | | ***0.87*** |
| KQ3 | The knowledge shared by members in the ESM is accurate. | 0.948 | |
| KQ6 | The knowledge shared by members in the ESM is timely. | 0.804 | |
| KQ5 | The knowledge shared by members in the ESM is reliable. | 0.778 | |
| KQ4 | The knowledge shared by members in the ESM is complete. | 0.716 | |
| KQ1 | The knowledge shared by members in the ESM is relevant to the topics. | 0.647 | |
| KQ2 | The knowledge shared by members in the ESM is easy to understand. | 0.436 | |
| ***Normative beliefs on knowledge sharing (NOB)*** | | | ***0.9*** |
| NOB2 | My boss thinks that I should share my knowledge with other members in the organization. | 0.952 | |
| NOB1 | My CEO thinks that I should share my knowledge with other members in the organization. | 0.942 | |
| NOB3 | My colleagues think I should share my knowledge with other membersin the organization. | 0.838 | |
| ***Personal Outcomes expectations (POE)*** | | | ***0.9*** |
| POE3 | Sharing my knowledge can build up my reputation in the company virtual community | 0.876 | |
| POE5 | Sharing my knowledge will strengthen the tie between other members | 0.866 | |
| POE6 | Sharing my knowledge will enable me to gain better cooperation from the outstanding members in the company | 0.836 | |
| POE2 | Sharing my knowledge will give me a feeling of happiness. | 0.790 | |
| POE1 | Sharing my knowledge will help me to make friends with other members in the company. | 0.773 | |
| POE4 | Sharing my knowledge will give me a sense of accomplishment. | 0.756 | |
| ***Organizational Identification (OI)*** | | | ***0.94*** |
| OI1 | How attached are you to the Company | 0.954 | |
| OI2 | How strong would you say your feeling of belongingness to the company | 0.954 | |
| **Control Variables** | | | |
| ***Fear of losing one's own value*** | | | ***0.79*** |
| FEAR4 | If I share my know-how I will lose my knowledge advantage | 0.908 | |
| FEAR5 | Knowledge sharing means losing power | 0.837 | |
| FEAR3 | willing to share my entire know-how with colleagues | 0.835 | |
| FEAR2 | I don't gain anything if I share my know-how | 0.687 | |
| FEAR1 | If I provide everybody with my entire know-how I am afraid of being replaceable | 0.628 | |
| ***Knowledge sharing vision (KSV)*** | | | ***0.89*** |
| KSV3 | Members in the ESM share the same value that helping others is pleasant. | 0.925 | |
| KSV2 | Members in the ESM share the same goal of learning from each other. | 0.893 | |
| KSV1 | Members in the ESM share the vision of helping others solve their professional problems. | 0.740 | |
| ***Community Outcome Expectations (COE)*** | | | ***0.92*** |
| COE4 | Sharing my knowledge would help the ESM grow. | 0.929 | |
| COE2 | Sharing my knowledge would help the ESM continue its operation in the future. | 0.926 | |
| COE3 | Sharing my knowledge would help the ESM accumulate or enrich knowledge. | 0.860 | |
| COE1 | Sharing my knowledge will be helpful to the successful functioning of the ESM. | 0.851 | |

**Note**. Name of the company and of the ESM were disguised for privacy reasons. The dimensionality and reliability of the constructs were tested both on the full sample and the sub-sample used for this study. No differences emerged regarding the dimensionality of the constructs and only negligible related to reliability.