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The impact of enterprise social media platforms on knowledge sharing

An affordance lens perspective

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Abstract

Purpose – Enterprise social media platforms (ESMPs) are web 2.0-based computer media tools that facilitate knowledge sharing by employees. The purpose of this paper is to outline the potential of ESMPs in both enabling and hindering knowledge sharing from the perspective of affordances.

Design/methodology/approach – This is a conceptual paper which integrates the literature on ESMPs' affordances and knowledge sharing.

Findings – This paper finds that prior research on affordances only considered artifacts without much attention on the role of individual goals and organizational context. ESMPs may both enable and hinder knowledge sharing by affording different user behaviors contingent on artifacts, individual goals and organizational context. Practical implications – The results of the paper will help managers and ESMPs designers to better understand the potential of ESMPs and pay attention to the positive and negative impacts of ESMPs in the process of knowledge sharing.

Originality/value — The paper derives a new categorization of affordances based on individual goals and organization context and portrays a model to describe how and when these affordances enable knowledge sharing through the development of transactive memory system and social capital and hinder knowledge sharing through overload, groupthink and privacy invasion.

Keywords Knowledge sharing, Affordance, Enterprise social media platforms, Negative impacts, Positive impacts

Paper type Literature review

1. Introduction

Driven by new management trends and innovations, enterprises are beginning to take full advantage of social collaboration tools such as enterprise 2.0. With these innovative tools, users can create their own web content, annotate others' content and interact with others on the web. Enterprise social media platforms (ESMPs) – a class of social interaction tools – are different from traditional communication technologies because employees can see the conversations exchanged among other partners (Leonardi *et al.*, 2013; Treem and Leonardi, 2012). ESMPs are more than just communication channels and serve as social interaction platforms for

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Journal of Enterprise Information Management Vol. 32 No. 2, 2019 pp. 233-250 © Emerald Publishing Limited 1741-0398 DOI 10.1108/IEIM-10-2018-0232 managing human resources, communication, learning, collaboration and knowledge sharing (Leonardi and Vaast, 2017; Segers, 2015). Among these social interaction behaviors, knowledge sharing plays a significant role within organizations.

Affordance theory offers a powerful lens for comprehending the relationship between ESMPs and knowledge sharing. It allows scholars to consider the ability afforded by the technologies and the interactions between actors and technical capabilities together (Hafezieh and Eshraghian, 2017; Oostervink *et al.*, 2016; Chaves *et al.*, 2018). In other words, the information technology (IT) artifacts, the individuals' goals and the organizational context collectively influence the extent to which affordances are realized. Such an interactive relationship has not received much attention in prior literature as prior studies generally considered affordances from the technical perspective only and not from the perspective of the individuals' goals or the organizational context (Ellison *et al.*, 2014; Fulk and Yuan, 2013). Moreover, prior studies have stated that ESMPs and their affordances have the potential to enable and curtail knowledge sharing. This study aims to answer the following research questions:

- RQ1. How are the affordances of ESMPs affected by individual goals and organizational context?
- RQ2. How do the affordances of ESMPs influence knowledge sharing in organizations?

To answer the above research questions, we re-categorized affordances and contribute to theory development by leveraging the explanatory mechanisms involving affordances and knowledge sharing. Bridging research about affordances of ESMPs and knowledge sharing can significantly help researchers to gain a better understanding of the contradictory potential of ESMPs. We suggest that the positive implication of ESMPs on knowledge sharing can be explained through the notions of transactive memory system (TMS) and social capital, which helps individuals identify knowledge on "who knows what" and "who knows whom" and enables the development of structural, relational and cognitive capital for sharing knowledge. Negative implications of ESMPs on knowledge sharing and their occurrence conditions have been extracted from existing literature.

The paper starts with a discussion of the theory of affordance more generally. It continues with a description of ESMPs affordances in prior literature. Next, the determinants of affordances and interactions between artifacts, individuals' goals and organizational context are introduced. Following this, we discussed how affordances enable and hinder knowledge sharing. The paper concludes with a discussion of the implications, limitations and suggestions for future research.

2. Theoretical background

2.1 Affordances

Affordance has attracted considerable attention in recent years, especially in the field of ESMPs (Cai et al., 2018; Leonardi, 2017; Ali-Hassan et al., 2015; Chaves et al., 2018). Although different studies have different definitions of affordance, it provides a new perspective to explain the impact of ESMPs on organizations and employees. The concept of affordance was raised by the psychologist Gibson in 1977 and was derived from the field of eco-psychology where affordance is the dynamic interaction between people and the materiality of the environment with which they come in contact and is considered to have an objective existence. Norman (1988) introduced this concept in the design field and suggested that there are two kinds of affordances when designers design an artifact: actual affordance and perceived affordance, of which the latter one was emphasized and viewed as dependent on actors' knowledge storage and experience. This concept was introduced into information systems by Hutchby (2001) describing affordance as the functional and relational aspects that frame but not determine the opportunities for action in relation to an object. Hartson (2003) defined and used four kinds of

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affordances in the context of interaction design: cognitive affordance (similar to perceived affordance), physical affordance (similar to actual affordance), sensory affordance and functional affordance. Using the technology affordances and constraints theory, Majchrzak and Markus (2012) explained the concepts of technology affordance and technology constraint, which refer to the potential interactions between individuals and technology. Technology affordance refers to what an individual or organization with a particular purpose can do with a technology. Pozzi *et al.* (2014) reviewed the existing literature and offered an affordance theoretical framework which has four elements: affordance existence, affordance perception, affordance actualization and affordance effect. Anderson and Robey (2017) introduced a novel concept, affordance potency, which is the strength of the relationship between the abilities of the individual and the features of the system.

These studies emphasized the concept of affordances as action potential that arises from individuals' goals and features of the IT artifact in an organizational context. This means that the features of technologies created by people may be the same but the affordances may vary depending on the individual's goal and organization's context (Ellison *et al.*, 2014). Affordances are not exclusive properties of materials or individuals but are constituted in the relationship within the material's feature, the individual's perception and organization's environment (Anderson and Robey, 2017). An affordance lens is useful for focusing jointly on the objects' materiality and the people's perceptions as it can help to explain why, when and how ESMPs can affect individual behavior in particular organizational contexts (Faraj and Azad, 2012).

2.2 The affordance of ESMPs

The purpose of this review is to understand issues surrounding knowledge sharing on ESMPs and determine future research opportunities. To accomplish a systematic literature review, we searched relevant articles in several databases such as ScienceDirect, Web of Science and SpringerLink to identify studies about ESMPs affordances and their influence on knowledge sharing. Prior literature offered different classifications of affordances, which are presented in Table I and consolidated in Table II to enable a research model.

| Study | Methodology | Affordance | Artifacts | Organizational context | Individual's goal |
|------------------------------|-------------|--|-----------|------------------------|----------------------|
| Boyd (2010) | Conceptual | Scalability; searchability; replicability; persistence | ~ | X | Χ |
| Faraj <i>et al.</i> (2011) | Conceptual | Reviewability; recombinability; experimentation | ~ | ~ | × |
| Treem and Leonardi (2012) | Conceptual | Visibility; editability; association; persistence | | Χ | Χ |
| Leonardi et al. (2013) | Conceptual | Leaky pipe; social lubricant; echo chamber | | Χ | Χ |
| Majchrzak et al. (2013) | Conceptual | Network-informed associating; triggered attending; metavoicing; generative role-taking | | / | / |
| Gibbs <i>et al.</i> (2013) | Case study | Display updates; signal availability; selectivity | ~ | | ~ |
| Wagner et al. (2014) | Conceptual | Reviewability; recombinability; association | Χ | Χ | Χ |
| Oostervink et al. (2016) | Conceptual | Associating; persistence; visibility; notified attention; selectivity | Χ | | ~ |
| Rice <i>et al.</i> (2017) | Empirical | Pervasiveness; editability; self- presentation, searchability; visibility; awareness | / | X | Χ |
| Kane (2017) | Conceptual | Digital trace; transparency; ubiquity | ~ | Χ | Χ |

Table I.
The affordances of ESMPs

| JEIM 32,2 | Affordance | Definition | Related affordance and research | Support |
|--------------------------------------|-----------------------------|--|---|------------|
| 32,2 | Reviewability | The enactment of technology- | Persistence (Treem and Leonardi, 2012) | Conceptual |
| | (Faraj <i>et al.</i> , | enabled new forms of working in | Scalability (Boyd, 2010) | Conceptual |
| | 2011) | which participants are better able | Searchability (Boyd, 2010) | Conceptual |
| | 2011) | to view and manage the content of | Visibility (Treem and Leonardi, 2012) | Conceptual |
| | | front and back narratives over time | Reviewability (Faraj <i>et al.</i> , 2011) | Conceptual |
| 236 | | | Leaky pipe (Leonardi et al., 2013) | Conceptual |
| | Editability | Ability to create new content, | Editability (Treem and Leonardi, 2012) | Conceptual |
| | (Treem and | modify the existing content and | Recombinability (Faraj et al., 2011) | Conceptual |
| | Leonardi, | carry on some other new | Experimentation (Faraj et al., 2011) | Conceptual |
| | 2012) | operations | Selectivity (Gibbs et al., 2013) | Case study |
| | | | Replicability (Boyd, 2010) | Conceptual |
| | Association | Ability to connect people with | Association (Treem and Leonardi, 2012) | Conceptual |
| | (Treem and Leonardi, | people, content with content and people with content | Network-informed associating (Majchrzak et al., 2013) | Conceptual |
| | 2012) | | Social lubricant (Leonardi et al., 2013) | Conceptual |
| | | | Echo chamber (Leonardi et al., 2013) | Conceptual |
| | | | Metavoicing (Majchrzak et al., 2013) | Conceptual |
| | Notified | Possibility to be notified when | Signal availability (Gibbs et al., 2013) | Case study |
| | attention | updates on related events happen | Triggered attending (Majchrzak et al., 2013) | Conceptual |
| | (Oostervink | and demand users' attention | Display updates (Gibbs et al., 2013) | Case study |
| | et al., 2016) | | Signaling (Rice et al., 2017) | Empirical |
| Table II. | Pervasiveness | Ability to communicate with | Pervasiveness (Rice et al., 2017) | Empirical |
| New category of ESMPs affordances | (Rice <i>et al.</i> , 2017) | others everywhere and anytime | Ubiquity (Kane, 2017) | Conceptual |

Affordance is the user's perception of an object's ability and ESMPs afford users behaviors which are impossible to achieve with traditional communication and collaboration tools. Several affordances for knowledge sharing have been proposed in prior research. Treem and Leonardi (2012) identified four affordances: visibility, editability, persistence and association. Majchrzak *et al.* (2013) proposed four affordances: metavoicing, trigger attending, network-informed associating and generative role-taking, and analyzed their positive and negative impacts on knowledge sharing. Boyd (2010) mapped out four affordances: persistence, replicability, scalability and searchability. Faraj *et al.* (2011) mentioned three technology affordances: reviewability, recombinability and experimentation. Leonardi *et al.* (2013) argued that ESMPs have three affordances: leaky pipe, echo chamber and social lubricant from the perspective of employees' communications. Rice *et al.* (2017) identified six affordances for organizational media: pervasiveness, editability, self-presentation, searchability, visibility and awareness based on the analysis of data from a Nordic organization. However, there are considerable variations in the coverage given to the IT artifacts, organizational context and individual's goals as shown in Table I.

We offer a consolidated view of the various affordances by reviewing prior literature in social media background as shown on Table II based on a reclassification as detailed below. Reviewability entails that participants are better able to view and retrieve the content of the front and back narratives over time (Faraj *et al.*, 2011; Boyd, 2010; Treem and Leonardi, 2012). It contains the following related affordances: persistence means information remains available to users and does not expire or disappear (Treem and Leonardi, 2012); scalability, proposed by Boyd (2010), means the potential visibility of content in networked publics is great; searchability refers that content in networked publics can be accessed through search (Boyd, 2010); visibility entails the ability to make behaviors, knowledge, preferences and communication network connections that were once invisible (or at least very hard to see) visible to others in the organization (Treem and Leonardi, 2012); reviewability entails that

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users can retrieve information, which is similar to searchability (Boyd, 2010), meaning content in networked publics can be accessed through search; leaky pipe means that the directionality of a particular communication (to whom it is directed) and the content of that communication are visible to people who were not involved in it (Leonardi *et al.*, 2013).

Editability is the ability to create new content, modify the existing content and carry on some other new operations. The original meaning of editability is that individuals can spend time and effort "crafting and re-crafting communicative acts before and after it is viewed by others" (Treem and Leonardi, 2012). Recombinability encourages users to make contributions to create more innovative ideas (Faraj *et al.*, 2011). Experimentation refers to the ability of encouraging users to try out new ideas (Faraj *et al.*, 2011). Selectivity allows users to select or subscribe to specific groups and content and control what is shared with whom (Gibbs *et al.*, 2013). Replicability means that content made out of bits can be duplicated (Boyd, 2010).

Association is the possibility to establish connections among users and content, and between users and contents (Treem and Leonardi, 2012). Network-informed associating is defined as "engaging in the online knowledge conversation informed by relational and content ties" (Majchrzak *et al.*, 2013). In other words, new connections can be more easily built between people who do not personally known each other before because they can see others' connection. Another affordance related to association is social lubricant, enabling users to connect and communicate easily to get work done quickly (Leonardi *et al.*, 2013). Also, ESMPs operate like echo chamber where like-minded people are connected with each other through content which they are interested in and reflects users' preferences (Leonardi *et al.*, 2013). Metavoicing refers to the ability to engage in the ongoing online knowledge conversation by building upon others' presence, profiles, content and activities (Majchrzak *et al.*, 2013).

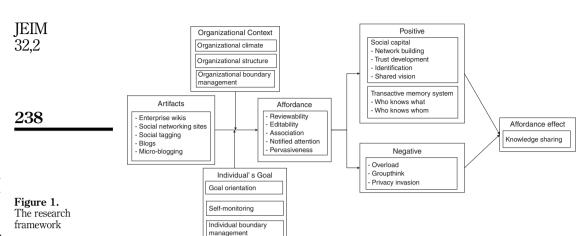
Notified attention refers to the possibility to be notified when updates on related events happen and demand users' attention (Oostervink *et al.*, 2016). Signal availability refers to the ability to use the "invisible" status to time-consuming continuous conversation while only scanning conversations for relevant and important updates (Gibbs *et al.*, 2013). Majchrzak *et al.* (2013) labeled a similar affordance as trigger attending, referring to users who remain uninvolved in online knowledge conversation "until a timely automated alert informs the individual of a change to the specific content of interest." Users can choose to make a response only if they want to do that and users may only scan conversations for updates rather than read them in detail so as to save time, which is explained as display updates (Gibbs *et al.*, 2013). Signaling is referred to the ability to receive notifications about other information or updates similar to what the users have just been viewing or are interested in (Rice *et al.*, 2017).

Pervasiveness means that users can communicate with others in any places at any time (Rice *et al.*, 2017). Users can get responses to others' requests quickly and communicate with others while moving, commuting and traveling (Rice *et al.*, 2017). This is related with ubiquity, which allows participants to seek and contribute knowledge nearly everywhere and anytime (Kane, 2017).

3. The determinants of affordances

This literature review shows prior studies assume several affordances can be determined by the new IT artifact, ESMPs, and focus on the effects of these affordances. These studies, in general, presume that affordance can be determined by the IT artifact, whereas it is really the result of the interaction between users and artifacts. Based on this original perspective of affordances, we propose several antecedents and expand Figure 1 (left side) to show such antecedents.

Affordances are not exclusive properties of actors or of artifacts – they are constituted in relationships between actors and artifacts with which they come in contact (Treem and Leonardi, 2012; Strong *et al.*, 2014). IT artifacts are defined as a "bundle of material and symbol properties



packaged in some socially recognizable form, e.g. hardware, software" and the nature of IT artifacts is considered to be functional (Maier and Fadel, 2009). We restricted our paper to focus on the following five artifacts: enterprise wikis (Brzozowski et al., 2009; Treem and Leonardi, 2012; Mäntymäki and Kai, 2016), social network sites (Treem and Leonardi, 2012; Mäntymäki and Kai, 2016), social tagging (Treem and Leonardi, 2012; Leonardi, 2017), blogs (Brzozowski et al., 2009; Treem and Leonardi, 2012; Mäntymäki and Kai, 2016) and micro-blogging (Treem and Leonardi, 2012; Mäntymäki and Kai, 2016). We chose these five because they are the artifacts which could be used to share knowledge and can reflect collaborative and interactive features of ESMPs. In addition, these artifacts can also be combined with mobile devices to create new scenarios for utilization within and outside organizations. Moreover, affordance is also influenced by individual's goals and the organizational context (see Figure 1). We reviewed literature about individual goals and organizational context in the context of ESMPs.

3.1 Individual goals

An individual's goals, including goal orientation, self-monitoring and boundary management, are key factors in influencing the achievement of affordances. Table III shows

| | A-reviewability | A-editability | A-association | A-notified attention | A-pervasiveness |
|------------------------|-----------------|---------------|---------------|----------------------|-----------------|
| Organizational context | | | | | |
| Structure | / | ✓ | / | | |
| Climate | ✓ | / | / | | / |
| Organizational | | | | | |
| boundary management | | | | | |
| Individual's goal | | | | | |
| Goal orientation | ✓ | ✓ | ✓ | _ | ✓ |
| Self-monitoring | / | ✓ | ✓ | ✓ | |
| Individual boundary | ✓ | | / | 1 | / |
| management | | | | | |

Table III.
Different moderators
moderating artifactaffordances
(A-affordance)

Notes: The construct in the rows of table represent the relationship between artifacts and corresponding affordance. For example, "A-reviewability" in this table (Line 3, Row 1) represent "the relationship between 'artifacts' and 'reviewability'". This table illustrates how organization context and individual's goals moderate "the relationship between 'artifacts' and 'affordances'"

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how the different aspects of an individual's goals moderate the relationship between the IT artifacts and the different affordances. Goal orientation could moderate the achievement of reviewability, editability, association, notified attention and pervasiveness (Fang, 2017; Yan et al., 2013; Rhee and Choi, 2017). Self-monitoring could moderate the achievement of reviewability, editability, association and notified attention (Wang and Noe, 2010; Snyder, 1974). Boundary management could moderate the achievement of association, notified attention and pervasiveness (Leonardi and Vaast, 2017; Yan et al., 2016).

According to the regulatory focus theory, employees in an organization always have two kinds of goals: striving to obtain achievement and avoiding punishment through two self-regulatory systems – promotion focus and prevention focus (Higgins, 1998). Promotion-focused individuals tend to regard obtaining profits and personal advancement as the highest objective, such as building network ties to collaborate and communicate with other colleagues (Leonardi and Vaast, 2017; Pee, 2018). By contrast, prevention-focused individuals might not engage in knowledge conversation on this platform because of their intention to prevent mistakes.

Several affordances enabled by the IT artifacts are moderated by goal orientation. Prevention-focused employees will put blogs and micro-blogging artifacts aside and not post new content or modify existing content because they may be concerned about making mistakes (Fang. 2017), being viewed as unprofessional and losing face (Yan et al. 2013). Therefore, the editability affordance may not be enabled. In addition, an employee only wanting to finish work and not attaching much importance to human relationships will not build social network ties actively. Moreover, although social tagging and social networking sites enable them to present themselves in their home page, such as adding self-description and avatar photos, they will not do that (Ahmed et al., 2019; Leonardi and Vaast, 2017). By contrast, when employees are promotion focused, IT artifacts can play a role. For example, corporate wikis, aiming to integrate information islands within enterprise and can improve work processes. Enterprise micro-blogging can also be used by promotion-focused individuals because they are more likely to contribute content actively in order to promote their reputation and increase their competitive advantage (Rhee and Choi, 2017; Wang and Noe, 2010). Other employees can see their contributions and build connections with them, enabling the achievement of reviewability, editability and association. In addition, with the help of mobile utilization, employees could handle business after work, which enables pervasiveness.

Self-monitoring, a concept introduced by Snyder (1974), refers to personality traits that is defined as an ability to regulate behavior to accommodate social situations. The difference in the self-monitoring behaviors is for the purpose of acquiring appraisal from others and protecting themselves from disapproval. Compared with low self-monitors, high self-monitors tend to modify their behavior on ESMPs to be accepted by others and express their pleasantness and benevolence (Snyder, 1974). For example, high self-monitors might actively "like" others', particularly supervisors' content on social networking sites to gain recognition, which enables reviewability and association (Wang and Noe, 2010). In addition, in order to establish a good reputation within the organization, high self-monitors may process messages and requests in a timely manner in case others have negative comments on them, enabling notified attention. Moreover, if a self-monitoring employee tends to avoid conflicts in groups and try to gain others' trust (Wang and Noe, 2010), he or she might not take the initiative to modify the existing content on enterprise wikis, which hinders editability.

Individuals' boundary management is the management of individual's working—non-working boundary and explains how individuals negotiate the work–family spheres and work–relaxation spheres to attain balance (Kossek *et al.*, 2012). It is related to the image they want to portray when facing different objects, which can be explained by self-presentation theory (Leary and Kowalski, 1990). Goffman (1959) suggested that people exhibit "pre-stage behaviors and behind-stage behaviors" at the same time. For example, when employees are

at organizations, he or she wants to establish a hard-working image to establish authority or gain approval. On the contrary, when coming back to home, he or she plays the role of husband or wife and wants to establish the image of a responsible family member.

Boundary management can moderate affordance as well (Leonardi and Vaast, 2017). For example, mobile utilization gives people opportunity to access ESMPs at any time and any place and have the state of being "always online." However, those people might not use it because they have strong awareness of boundary management. They tend to log off or shield groups' messages. In addition, social networking sites may enable colleagues to see each other's information (Chakraborty *et al.*, 2013). However, those separating personal life and work apart will not share relatively private information to all audiences within the organization, such as personal photo, interests and telephone number. This hinders the achievement of reviewability (Yan *et al.*, 2016).

3.2 Organizational context

It is widely acknowledged that organizational context could affect the actualization of affordance. However, the fact is that few researchers consider the role of organizational context when talking about affordance. Although Rico and Xia (2018) fill this gap by studying the effect that IT-culture fit has on IT affordance actualization, there still lacks a systematic point of view of the role that organizational context plays in the process of achieving affordances. Organizational context includes organizational climate, organizational structure and organizational boundary management. Table III shows how the different aspects of organizational context influence the relationship between IT artifacts and different affordances.

Organizational climate refers to the contextual situation within an organization and sometimes subject to individuals with influence and power (Bock *et al.*, 2005). Affordances can be influenced by temporary and subjective organizational climate. For example, in a climate that encourages group identity and denounces self-interest, employees are willing to finish work tasks within their private time, which suggests that pervasiveness can play a role (Serenko and Bontis, 2016). In addition, although ESMPs have the function of storing knowledge, individuals may delete them artificially because of their desire for privacy. In other words, if the organizational climate is open (Cai *et al.*, 2018) and encourages trust (Cai *et al.*, 2018; Wang and Noe, 2010), users will have more possibilities to save, edit or modify existing content through enterprise wikis, blogging and micro-blogging on ESMPs. This ensures the affordances of editability, visibility and persistence. In addition, employees will have greater intentions to use artifacts such as micro-blogging to express their ideas, which can enable the affordances of reviewability and association.

Organizational structure includes organizational centralization and organizational formalization. The former refers to the strict hierarchical system, and the organization's authority is controlled by senior leaders (Kim and Lee, 2006). In organizations with a high degree of centralization, employees have lower decision-making power for work, less interaction at work and lack of a sense of responsibility. Therefore, they will not utilize artifacts such as enterprise wikis because of limited authority, and editability could not be enabled. Organizational formalization means that all activities are carried out according to written rules and regulations (Kim and Lee, 2006). Organizations with less formalization are often more open and flexible and are more conductive to communication and interaction (Kim and Lee, 2006), which creates less formal atmosphere and leads to more organizational socialization (Graham and Pizzo, 1996). Therefore, individuals could use IT artifacts better to enable ESMPs' affordances of association.

However, editability and reviewability are partly in conflict (Wang and Noe, 2010; Bock et al., 2005). When people modify or delete the content they contributed, these original contents will not always be on ESMPs and visible to other employees. In other words, if you want your

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contribution or content visible to others, some features of editability could not be enabled. If you want to achieve editability, some features of reviewability would become invalid.

Another aspect playing an important role in ESMPs is boundary management. Unlike individual boundary management, organizational boundary management can be defined as how teams or organizations take effort to establish and manage interaction with external parties. Nowadays, employees, customers and even competitors can be on the same ESMPs and bond connections easily (Leonardi and Vaast, 2017). However, in order to protect knowledge intelligence and customer privacy, not all content can be exchanged across teams and organizations. Many organizations, therefore, have written regulatory policies and managerial initiatives to control the boundaries (Banghart *et al.*, 2018), which may discourage the achievement of affordances.

4. Affordance effect: knowledge sharing

"Affordance effect" was adopted to portray the implication of affordances, which is knowledge sharing in this paper (Pozzi *et al.*, 2014; Hafezieh and Eshraghian, 2017). Although the positive influence of affordances on knowledge sharing has received greater attention in prior studies, there are negative impacts as well. We reorganized the positive and negative influencing mechanism of affordances on knowledge sharing, which are discussed in detail below and summarized in Figure 1 (right side). Different from prior studies, we extracted key influencing mechanisms and identified reasons why affordances could have negative influence on knowledge sharing.

4.1 Positive effects

Prior literature has proposed and examined the impacts of ESMPs on knowledge sharing from the perspective of ESMPs' specific functions. For example, ESMPs enable employees to repost other's contents, making contribution of others' knowledge possible with new audiences. Meanwhile, ESMPs are mainly used to facilitate knowledge sharing by distributing messages within groups that engage in long conversations, such as the "group chat" feature of enterprise WeChat, in which individuals can communicate and share knowledge with each other easily and protect the privacy of files at the same time (Zhang et al., 2010). Trigger attending enables employees to receive a signal when some contents related to them occur. At that time, you can share knowledge with knowledge seeker. In other words, the existence of notified attention reduces the possibility of individual's ignorance of messages and increases the frequency of knowledge sharing. In addition, searchability and selectability allow individuals to search and subscribe to the content they are interested in from a wider audience (Rice et al., 2017; Gibbs et al., 2013).

4.1.1 Transactive memory system. The impact of ESMPs on knowledge sharing can be explained using the TMS as well (Davison et al., 2013; Fulk and Yuan, 2013; Leonardi, 2015, 2017). TMS refers to the combination of individuals' memory within an organization with regard to the process of encoding, storage and retrieval stage of knowledge from different domains (Wegner, 1987). It provides meta-knowledge existing within social media: knowledge about "who knows what" and "who knows whom" (Davison et al., 2013). Therefore, employees can retrieve needed knowledge on ESMPs successfully (Huang and Chen, 2018). Following the perspective of affordance, Table IV shows which affordance could bring about the development of TMS.

Reviewability of ESMPs helps members to identify knowledge. The information on the ESMPs are transparent (i.e. employees are exposed to conversations with other colleagues, as they can see messages between their colleagues) and employees can recognize and gain knowledge from those messages (Leonardi, 2015). The post and search features of ESMPs are designed to help employees to locate required knowledge. ESMPs provide a knowledge

map with which members can find documents and the authors of meta-knowledge (Choi et al., 2010). In addition, reviewability of ESMPs enables network members to identify expertise. Through the visibility of ESMPs, employees can see the information and activities of other teams so that they can identify and seek expertise successfully (Treem and Leonardi, 2012). Enterprise social network sites, which can be seen as one function of ESMPs, provide informal networks (Fulk and Yuan, 2013). For example, users can use informal language to convey personal opinions through comments. Those did not participate in conversation can also see comments, likes and other information to identify which employees are respected in which areas, as well as who has the expertise within a particular field (Ellison et al., 2014; Majchrzak et al., 2013).

Association of ESMPs helps members to identify knowledge and cross the organizational boundaries to know what they might not know before. ESMPs also allow employees to post journals through which employees can provide and extract knowledge (Davison *et al.*, 2013). Knowledge seekers in ESMPs can connect with each other and access internal and external knowledge sources (Ahmed *et al.*, 2019). In addition, association of ESMPs helps members to identify expertise as well. Some ESMPs have a system for recommending expertise or the person who had the knowledge you need to know (Huysman and Wulf, 2006). Association affordance connects knowledgeable members in social networks and support expertise identification (Treem and Leonardi, 2012).

TMS provides necessary meta-knowledge to enable employees to share knowledge with others effectively. Previous studies have shown that a well-developed TMS could lead to effective knowledge sharing (Choi *et al.*, 2010). An organizational team having completed TMS can retrieve knowledge by recognizing what knowledge others have.

4.1.2 Social capital. Table IV shows other scholars explained the impact of ESMPs affordances on knowledge sharing through social capital theory. This concept was introduced by Coleman (1988) and can be conceptualized into structural, cognitive and relational dimensions (Nahapiet and Ghoshal, 1998). Structural dimension is "an overall pattern of connections between actions" and relates to the network structure and ties that give participants the opportunity to share knowledge (Nahapiet and Ghoshal, 1998). It includes social network ties, network density and network centrality. Relational dimension represents assets developed through social interaction between participants (Nahapiet and Ghoshal, 1998). It focuses on the elements such as trustworthiness, shared norms, shared obligation, reciprocity, identification and commitment. Cognitive dimension reflects the common understandings that facilitate interactions (Ali-Hassan et al., 2015). It consists of shared language, shared goals, shared meaning and shared narratives (Chiu et al., 2006).

First, from the structural dimension, ESMPs are designed to create weak ties and strengthen strong ties, which help create opportunities to combine and share knowledge (Majchrzak *et al.*, 2013; Fulk and Yuan, 2013; Oostervink *et al.*, 2016). Participants can easily find others

| | Transactive systems | Social capital | Information overload | Overload Communication overload | Social overload | Groupthink | Privacy invasion |
|--------------------------------------|---------------------|-------------------|-------------------------|---------------------------------------|--------------------|------------|---------------------|
| Reviewability Editability | <i>/</i> | ~ | ~ | | | ~ | ~ |
| Association Notified attention | ~ | ~ | ~ | ~ | ~ | ~ | |
| Pervasiveness | | | ~ | / | | | ~ |

Table IV.Positive and negative impacts induced by affordances

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through the contact list because they are listed consistent with the organizational structure. Social lubricant helps participants to know what other members are doing and then establish relationships quickly with higher levels of psychological safety (Leonardi *et al.*, 2013). In addition, ESMPs help members to learn about the interests of others, encourage members to overcome organizational boundaries to build new connections and share knowledge with others (Treem and Leonardi, 2012). These social interactions within networks can accumulate social capital, especially among those with weaker and more heterogeneous social ties, which can result in the creation of new information for a wider world, thus influencing the quality of knowledge sharing as well (Ellison *et al.*, 2014; Fulk and Yuan, 2013).

Second, from the relational dimension, individuals would join together regarding common issues and topics which they are interested in through ESMPs (Chiu *et al.*, 2006). The perception of unity and togetherness will activate employees to contribute knowledge and increase the depth and breadth of contributed knowledge through this common understanding (Huysman and Wulf, 2006). Therefore, they may be more willing to take the initiative to contribute to their knowledge. In addition, affordance can affect knowledge contributing as trust among employees becomes stronger with the support of ESMPs. Offong and Costello (2017) suggested that the affordance of echo chamber could create network ties among individuals who have similar interests or visions, resulting in trust among colleagues, which enables a willingness and readiness to contribute knowledge. Given by echo chamber, employees prefer to share knowledge with others of similar attributes because similarity increased attraction and limited the risks of knowledge sharing (Hwang *et al.*, 2015). Moreover, the affordance of visibility enables the existing social network ties transparent and reduces social pressures, which fosters trust and motivates knowledge sharing (Ellison *et al.*, 2014; Huysman and Wulf, 2006; Leonardi *et al.*, 2013).

Third, affordance can affect knowledge sharing through the cognitive dimension, i.e. shared language and shared vision. ESMPs provide a platform to tie people with each other and other content they are interested in for building common language through which individuals will be motivated to participate in knowledge exchange activities actively, which can lead to more effective knowledge contributing (Huysman and Wulf, 2006; Chiu *et al.*, 2006). The virtual community of ESMPs combines participants having common interests and common goals to contribute knowledge better, such as work-related file sharing in the group (Chiu *et al.*, 2006). In particular, ESMPs foster interaction and informal communications, which contribute to the emergence of shared goals, promotion of emotional closeness and positive effect on knowledge sharing (Fulk and Yuan, 2013).

4.2 Negative effects

The use of ESMPs not only facilitates but also hinders knowledge sharing. We identified three negative impacts that present mechanisms through which affordances hinder the process and productivity of knowledge sharing: overload, groupthink and privacy invasion. Overload caused by ESMPs can be divided into information overload, communication overload and social overload (Yu et al., 2018). Information overload represents the situation when individuals are presented with a large amount of information generated on ESMPs, which exceeds the capacity they can process (Yu et al., 2018). Communication overload refers to a situation when the communication demands from ESMPs exceed individuals' communication capacities thereby causing excessive interruptions in their jobs to the point individuals become less productive (Larose et al., 2014). Social overload is defined as a situation when individuals perceive they are giving too much social support to people embedded in their network on ESMPs out of a sense of duty to respond to social support requests (Yu et al., 2018). In addition, ESMPs affordance may cause groupthink and privacy invasion (Cai et al., 2018; Leonardi and Vaast, 2017). Table IV shows which affordance brings about these negative impacts separately.

First, affordances could cause information overload since there is a large amount of information out of one's control. Notified attention and reviewability enable users to access too much knowledge, which are both work related and profession related because of users' willingness to promote their work performance and professional skills (Oostervink *et al.*, 2016; Gibbs *et al.*, 2013). Without appropriate organizational governance toward information management, persistence affordance enables employees to be accessible to previous information all the time and increases the memory of organizations. When searching information through ESMPs to solve problem and make decision, individuals can be provided with a vast amount of knowledge than necessary, making individuals miss important knowledge (Yu *et al.*, 2018; Kwahk and Park, 2018). This can diminish the attitude to and quality of knowledge sharing (Razmerita *et al.*, 2016; Oostervink *et al.*, 2016). Enabled by pervasiveness, ESMPs users could receive work-related information in private time, bringing negative mood and using exhaustion. Therefore, they may refuse to share knowledge.

Second, affordances may cause communication overload as well. Pervasiveness facilitates ubiquitous and continual connectivity, enabling individuals to be open to communicate with others at anytime and anywhere (Rice *et al.*, 2017). Generally speaking, people tend to handle matters from different sources no matter what they are doing. Therefore, the unplanned communication may distract employees' attention on work and break their thoughts under corporate logic, which may cause them to have negative attitude toward others and refuse to share knowledge (Yu *et al.*, 2018). Association connects individuals with others and communication overload occurs when employees are exposed to great amount of connections and these demands of reception and interaction have detrimental effects on people and cause ESMPs exhaustion (Larose *et al.*, 2014). They will be eager to get out of ESMPs and not participate in the process of knowledge sharing.

Third, though association can bridge and bond social capital, excessive social capital might result in a social overload, where non-work communication and gossip become commonplace (Leonardi *et al.*, 2013). Moderate chatting is beneficial to individuals by helping to have relaxation before focusing again on work. However, too much chatter and non-work related communication is detrimental for group productivity. Maier *et al.* (2015) explained social overload phenomena from social support theory. The need to maintain relationships in the form of giving enough care to others, such as "like" others' content in time may lead to short-term exhaustion that discourages employees to engage in knowledge sharing (Chen and Wei, 2019; Maier *et al.*, 2015).

Fourth, echo chamber, which integrates people with similar background together on ESMPs, can bring groupthink and reduce the low integration of knowledge across disparate communities (Leonardi and Vaast, 2017; Leonardi *et al.*, 2013). Also, metavoicing can lead to groupthink using critical mass theory (Majchrzak *et al.*, 2013). For example, when an organization asks for employees' opinions on an issue on ESMPs, metavoicing could enable them to make voice. However, some employees, especially those who have different ideas than the majority, tend not to participate in this knowledge conversation by hiding their real ideas and expressing ideas similar to others because of their desire to be accepted by majority group. Therefore, their knowledge could not be converted to others and to the organization, restricting the free flow of knowledge and this knowledge conversation on ESMPs would be less efficient (Andrews, 2010).

Fifth, affordance may cause privacy invasion. Privacy refers to knowledge privacy, meaning that some knowledge, involving individual's privacy or organization's confidentiality, is not suitable for sharing to a wide audience. At this time, visibility will be seen as one affordance which may cause privacy invasion and discourage users to share knowledge (Majchrzak *et al.*, 2013). Privacy also refers to the right to restrict the transmission of personal information to others (Sun *et al.*, 2018). Employees concerning about their own privacy are less likely to share much knowledge if ESMPs are more transparent (Shao and

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Pan, 2019). "Return receipt" feature and pervasiveness affordance during communication are considered invasion of privacy because employees suggest that this is one way to collar their own time (Gibbs *et al.*, 2013; Majchrzak *et al.*, 2013). In addition, from logics of family, users may not build too much network with strangers on ESMPs and may not want to use ESMPs after work because they are family-oriented (Gözükara and Çolakoğlu, 2016). Therefore, association and pervasiveness may be viewed as privacy invasion by these individuals.

5. Discussion

Integrating the influencing mechanisms discussed above, the overall framework shown in Figure 1 shows five artifacts that influence ESMPs affordances based on different individual goals and organizational context. This is consistent with the definition of affordance but missing in prior literature, which considers affordance from a technical perspective only. In addition, the positive and negative influences of affordances on knowledge sharing are clearly explained.

5.1 Implications

The literature review showed that extant understanding of affordances may not be comprehensive. We expanded previous research by outlining a framework to illustrate the antecedents and effect of affordances, helping scholars to understand the theory of affordances better.

Our study has three practical implications. First, individuals with different goals may use ESMPs in different ways, which implies that ESMPs may have different affordances given same artifacts. Therefore, it may be ineffective to let employees use ESMPs as their wish. Organizations should give them enough guidance and usage norms because different types of individuals will achieve different affordances. If one person is prevention focused, he or she may not actively share his or her knowledge or working progress on ESMPs due to the worry of losing face or making mistakes. In such a situation, organizations could formally require employees to post working log on ESMPs every day.

Second, we found that three elements of organizational context can help managers cultivate an environment conducive to achieve affordances. Not every artifact of ESMPs and corresponding affordance is needed for every organization. For example, a task-oriented organization may not want employees to spend too much time interacting with others, meaning association affordance could not be greatly enabled. An organization under high pressure and sense of competition wants its employees to be work-oriented and always online on ESMPs. Then, the pervasiveness affordance is needed and organizations could encourage employees to do so by giving them corresponding rewards. In other words, when an organization introduced a new ESMP, it needs to formulate norms about the usage of ESMPs according to its own context.

Third, this study examined positive and negative influencing mechanisms of ESMPs on knowledge sharing. Managers should consider different conditions and facilitate knowledge sharing accordingly. Also, knowledge has different meanings to different individuals. ESMPs designers could plan for different alternatives to give individuals enough autonomy when they decide whether to share or not and what knowledge to share. In addition, organizations should formulate governance mechanisms to regulate ESMPs usage, such as controlling use time and frequency to alleviate reliance on ESMPs and assign specific individuals to manage knowledge on ESMPs, which can solve the dilemma of overload.

5.2 Limitations and future directions

This study has several limitations that leave open future research directions. Our study synthesizes existing literature on affordances in ESMPs and presents an overall model for

research that incorporates both positive and negative influences as well as individual goals and organizational context. We suggest that in the future, researchers could expand their repertoire of methods to empirical studies, case studies and even natural experiments to examine the research model. As for empirical studies, Rice *et al.* (2017) has proposed the items of affordances and Pee (2018) adopted and expanded their items. Apart from the data collected from questionnaire and interview of employees, researchers can make use of the ESMPs' server-side data which can provide employees' evidence of interaction content and record of behavior. Researchers may also find natural experiments helpful in uncovering the mechanisms underlying affordances and knowledge sharing.

The second limitation is that we divide the process of ESMPs' influence on knowledge sharing into two parts: the antecedents of affordance and affordance effect. This classification is a little simple because there may be some interactions in these two phases. For example, individual goals may still influence knowledge sharing after affordance has been achieved. In addition, to solve the negative impacts of affordances, organizations may have different norms and governance mechanisms, which could be the antecedents of affordance. In addition, we focused on affordances which could be achieved given some premises – specific artifacts, organizational context and individual goals. Some other affordances may occur if premises are changed. Therefore, future studies could examine such relationships.

The third limitation is that we only identified conditions for the negative impacts of affordances on knowledge sharing. Few researchers talked about the contradictory influencing mechanism of ESMPs on knowledge sharing. Most researchers studied positive and negative impacts separately. We considered it together because of the complex influencing mechanism of ESMPs affordance on knowledge sharing and we aimed to identify the conditions of contradictory influence. However, we found that it is hard to extract conditions applying for positive and negative impacts at the same time, leading us to only organize the conditions for negative impacts. Therefore, future studies could do more to find key conditions for positive impacts as well.

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