Consequences of Enterprise Social Media Network Positions for Employees

A Literature Review and Research Agenda

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Abstract Employees often use enterprise social media (ESM) for communication, collaboration, and knowledge sharing, leading to ESM networks–that is, social networks of interrelated employees based on ESM. Many organizations possess ESM networks, and there is increasing research on their consequences for employees depending on how these employees are positioned in such networks. ESM network research is complex and consists of various interrelated dimensions. However, a synthesis of the abovementioned studies is lacking. Therefore, the current body of knowledge may obfuscate how the different dimensions interrelate, impeding a more holistic understanding of the consequences that employees may experience depending on their network positions. Moreover, there is little understanding of which research topics in this area have been addressed to date and where further research is needed. This paper addresses these gaps by means of a literature review and research agenda that synthesizes past studies. The results emphasize that whether ESM are beneficial for and exert a positive influence on employees largely depends on the employees' positions in the underlying networks.

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1 Introduction

Employees use various media, such as e-mails and offline interactions, to communicate, collaborate, or share knowledge with each other. Hence, social networks–defined as a set of actors interrelated by dyadic ties (Wasserman and Faust 1994)–are common within organizations (Borgatti and Foster 2003). Examples are e-mail and offline interaction networks. In this context, a new media type has become popular in recent years–enterprise social media (ESM). Examples are Jive, Atlassian Confluence, and HCL Connections. ESM enable employees to connect and interact with each other in digital ways, akin to Facebook, Tumblr, or Wikipedia on the internet (Kaplan and Haenlein 2010). Since their emergence in the mid-2000s (McAfee 2006), ESM have become a driver of internal digital transformation (Feitosa et al. 2020). It is expected that the ESM market will achieve a double-digit increase by 2026 (Research and Markets 2018).

As with traditional media, employee communication, collaboration, and knowledge sharing in ESM lead to a specific type of social network (Kane et al. 2014). Consequently, many organizations have ESM networks in which communication, collaboration, and knowledge sharing among employees interrelated via ESM-enabled ties occur (Kane et al. 2014; Schötteler 2022). ESM networks have different positive and negative consequences for

employees depending on the employees' specific network positions, meaning how or with whom they are interrelated in such networks (Borgatti and Foster 2003; Kane et al. 2014). For instance, employees who maintain strong interaction ties in ESM networks can exploit this position to increase their job performance (Riemer et al. 2015). Receiving self-promotional messages through work-related ties with self-promoters can reduce the ESM usage of employees who receive this content (van Osch et al. 2016).

Many empirical studies explore how the consequences of ESM networks for employees vary depending on the employees' positions in the networks. However–despite the existence of various related literature reviews (e.g., Dittes and Smolnik 2017; Sun et al. 2021)–no review that synthesizes the aforementioned studies could be found. Nevertheless, ESM network research is complex and encompasses a variety of interrelated dimensions. ESM networks can be divided into different layers, employees can occupy various network positions in different layers simultaneously, and each position can lead to a number of consequences (Kane et al. 2014; Trier and Richter 2015). Conversely, single empirical studies often only focus on specific consequences resulting from specific positions at specific layers. Such studies provide valuable findings. However, the findings may need to be conceptually integrated with related findings first to better address the complexity of ESM networks and to provide a more holistic view of the networks' consequences (Byrne 1999). For example, central employees in ESM networks who constantly interact with several other employees often experience increased job performance due to better access to relevant content (Lu et al. 2015; Suh and Bock 2015). However, having such a position can also promote information overload if the employee receives an excessive amount of content through associated flow ties–a consequence actually associated with decreased job performance (Chen and Wei 2019). Another challenge arising from the complexity of ESM networks is that there is little understanding of which research topics in this area have been addressed to date and where further research is needed.

This paper closes these gaps via an integrative literature review and research agenda relevant to academics and practitioners which synthesizes past empirical outcomes (Cooper 1988). In this process, the paper addresses two research questions (RQs): What do past empirical studies impart about the consequences of ESM network positions for employees (RQ1)? Which issues should future empirical studies on the consequences of ESM network positions for employees address (RQ2)? To answer the RQs, we followed the recommendations by vom Brocke et al. (2009, 2015). First, we conducted a systematic literature search to accumulate empirical literature with findings about the consequences of ESM network positions for

employees. Then, we categorized the findings into a concept matrix (Webster and Watson 2002). For this step, we used the typology from Borgatti and Foster (2003), adapted to ESM networks as per Kane et al. (2014). This typology enables a sound categorization based on four research types addressing how such consequences vary based on different network positions. Following Webster and Watson (2002), we then synthesized our populated concept matrix, resulting in a review and an agenda to answer RQ1 and RQ2, respectively.

This paper enhances the current body of literature reviews with a more holistic perspective on the consequences that employees experience based on their specific positions in ESM networks. Moreover, it promotes scientific progress by revealing insights about relevant gaps. For theory, the paper displays that ESM affordances (Treem and Leonardi 2012) can influence the consequences derived from specific network positions. Furthermore, it indicates that ESM networks allow for cultivating three types of social capital (Adler and Kwon 2002). Moreover, it emphasizes the relevance of flow ties (i.e., ties that symbolize content transfer) in ESM networks. Lastly, it provides examples of how network characteristics can influence employee consequences. For practice, the paper illustrates the relevance of non-work-related compared to work-related ties (Luo et al. 2018). Moreover, it facilitates deducing interventions from the currently fragmented knowledge in order to manage the consequences of network positions for employees, thus improving the benefits of ESM. Lastly, it displays which positions employees should seek to improve their benefits of using ESM.

2 Theoretical Foundations

2.1 Social Media, Enterprise Social Media, and Enterprise Social Media Networks

In general, social media are "*a group of internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content*" (Kaplan and Haenlein 2010, p. 61). Common social media on the internet are online social networks (e.g., Facebook), blogs (e.g., Tumblr), and wikis (e.g., Wikipedia) (Kaplan and Haenlein 2010) (Fig. 1).

Many organizations employ internal social media platforms (Feitosa et al. 2020) to support internal connections, communication, collaboration, and knowledge exchange (McAfee 2006). These platforms are specifically adapted for organizational purposes and are commonly referred to as ESM (Leonardi et al. 2013). ESM can be defined as "web-based platforms that allow workers to (1)
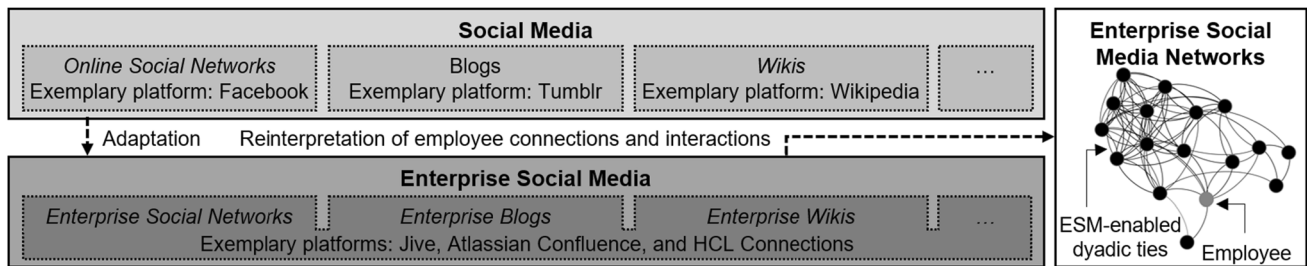
Fig. 1 The relation between social media, enterprise social media, and enterprise social media networks

communicate messages with specific coworkers or broadcast messages to everyone in the organization; (2) explicitly indicate or implicitly reveal particular coworkers as communication partners; (3) post, edit, and sort text and files linked to themselves or others; and (4) view the messages, connections, text, and files communicated, posted, edited and sorted by anyone else in the organization at any time of their choosing." (Leonardi et al. 2013, p. 2). Common ESM are Jive, Atlassian Confluence, and HCL Connections. Synonymous terms for ESM are enterprise social networks (ESN) and enterprise social software (ESS) (Wehner et al. 2017). Note that ESN can refer to both a synonym of ESM (Wehner et al. 2017) or to an ESM function (Engler and Alpar 2017). In this paper, we adopt the latter definition.

In contrast to public social media, multiple ESM functions are commonly integrated within the underlying ESM (Leonardi et al. 2013). For instance, many ESM rely on an ESN (an ESM function) as an entry point, but within the platform, one may often also find enterprise wikis and enterprise blogs, among other ESM functions (Leonardi et al. 2013). Moreover, enterprise wikis and enterprise blogs are often simply referred to as wikis or blogs, respectively (Engler and Alpar 2017).

According to Treem and Leonardi (2012), ESM provides four affordances that can influence ESM employee connections and interactions. The first is visibility, meaning that ESM affords employees the ability to make themselves and their connections visible to others in the organization. The second is persistence, meaning that an employee's communication activities in ESM remain accessible even after they log out. The third is editability, meaning that employees can spend much time and effort to craft and recraft their own content in ESM before–and often also after–making it visible to others. The last is association, meaning that ESM affords employees the possibility to connect with content or other employees in the ESM. Various communication media provide such affordances. However, ESM is unique in the sense that it provides all four (Treem and Leonardi 2012). ESM is also malleable, which means that the purpose of the connections as well as the purpose and content of the interactions are

not prescribed. Rather, ESM can be used for various distinct and individual purposes, increasing the heterogeneity of connections and interactions taking place in ESM (Richter and Riemer 2013).

Through the lens of social network research, the collective of such connections and interactions can be reinterpreted as ESM networks (see Kane et al. 2014, p. 293 for an example). In general, a social network is a set of actors interrelated by dyadic ties (Wasserman and Faust 1994). Translated to ESM networks as a specific type of social network, the actors are employees, and the dyadic ties are ESM-enabled and represent connections, communication, collaboration, or knowledge exchange (Kane et al. 2014; Schötteler 2022).

ESM networks have four characteristics resulting from the underlying ESM (Kane et al. 2014). The first is digital profiles, i.e., employees in ESM networks are represented by a digital profile that is constructed by the employee, other employees in the ESM network, and the underlying ESM. The second is search and privacy, meaning that an underlying ESM's features for content search and privacy influence how the employees in an ESM network can access content via their ties–or protect content from their colleagues. The third is relational ties, i.e., employees can use the underlying ESM to articulate a list of those with whom they share a relational tie in the network. The last is network transparency, which enables the employees to use the underlying ESM to view and traverse their ties and those made by others.

2.2 Network Positions and Research on the Consequences of ESM Network Positions

In general, a network position characterizes what a social network looks like from the perspective of an actor (Brandes 2016). Put differently, an actor's network position is specified as the actor's set of present and absent ties with the other actors in the network (Burt 1976). Two network position perspectives exist (Burt 1992). The "how" perspective focuses on *how* a focal actor is interrelated with the residual actors in the network (e.g., by counting the number of ties the actor has in the network). The "who"

perspective focuses on *with whom* a focal actor is interrelated with in the network (e.g., to actors with specific resources). Transferred to ESM networks, an employee's network position refers to how this employee is interrelated with the residual employees in the network or with whom the employee is interrelated in the network.

ESM networks are multilayered, such that employees are often positioned in more than one network layer (Trier and Richter 2015). Studies differentiate between four layers–the proximity, relation, interaction, and flow layer (Kane et al. 2014). The proximity layer consists of ties representing co-presences of employees in shared virtual spaces, such as co-memberships in the same ESM groups. The relation layer consists of ties representing persistent social connections (e.g., who follows whom) between employees. The interaction layer consists of ties representing discrete and transitory relational events between employees (e.g., sending a message, viewing a profile, liking a comment, or sending a friend request). The flow layer consists of ties representing the actual tangible or intangible material transferred between employees (e.g., work-related information, leisure information, or social cues). The four layers are decoupled from each other (Kane et al. 2014). For instance, an employee may receive a specific piece of work-related information through a message from another employee or by using a search bar without interacting with the employee. Aggregating different network layers to a single overarching network can have strong biases and limitations (Wasserman and Faust 1994, p. 219), as the consequences that employees experience from specific network positions may differ based on the underlying layer. For instance, having high centralities in the flow layer may have a stronger impact on information overload than in the relation layer. Hence, we apply the aforementioned layer differentiation approach in our concept matrix to increase the validity of our review.

Empirical research on the consequences for employees resulting from different network positions has a long tradition (Borgatti and Foster 2003). To categorize such research, Borgatti and Foster (2003) created a typology containing four research types. Kane et al. (2014) then discussed this typology for ESM networks. The resulting typology is shown in Fig. 2 and is consistent with the categories of our concept matrix. The typology categorizes empirical research in this field according to the dimensions of "explanatory goals" and "explanatory mechanisms" (Borgatti and Foster 2003). Explanatory mechanisms are used to categorize research according to whether it addresses content or structure (Borgatti and Foster 2003). Structure refers to the structure or topology of a specific network position, including the quantity and characteristics of ties maintained in this position (e.g., by measuring centralities and tie strengths) and the different

consequences for employees resulting from such positions, such as control benefits or increased ESM usage. These studies are in line with the "how" perspective of social network research and tend to disregard the actual contents accessible through the ties maintained in an employee's network position (Borgatti and Foster 2003). Next to structure, studies may address content. They focus on the actual resources accessible through the ties maintained in a specific network position, such as knowledge and social support, and how these resources have consequences for the employees in such positions, such as affective commitment (Borgatti and Foster 2003). These studies are consistent with the "who" perspective of social network research and interpret ties as conduits to other employees through which information and aid flow (Borgatti and Foster 2003).

Explanatory goals categorize studies based on whether they explain performance variation or social homogeneity (Borgatti and Foster 2003). Performance variation describes how and why employees can benefit from, or are negatively affected by, specific ESM network positions (Borgatti and Foster 2003). Employees are regarded as active and rational agents who exploit the specific positions they find themselves in to achieve positive consequences, such as improved knowledge or reduced social overload (Borgatti and Foster 2003). These studies are consistent with the "agency" perspective in social network research. Agency considers a social network to be a leverageable construct or opportunity that actors can actively exploit, leading to performance variations (Barker 2003). In contrast, social homogeneity describes how specific similar ESM network positions exert a common influence among employees. The network and employee positions are regarded as a given. These researchers analyze the network's shared consequences in terms of behaviors, beliefs, cultures, practices, and attitudes for all employees in the network or in similar network positions (Borgatti and Foster 2003). These studies are congruent with the "structure" perspective in social network research. Structure considers the ESM network to be a constraining factor, which exerts a common influence on the employees in the network, leading to social homogeneity (Barker 2003).

By combining the explanatory goals and mechanisms, four types of empirical research on ESM network consequences can be identified (Borgatti and Foster 2003; Kane et al. 2014), namely structural capital, environmental shaping, resource access, and contagion. Structural capital addresses how and why employees in specific network positions can actively benefit from or are negatively affected by the structure of their position. Environmental shaping addresses how and why the structure of specific network positions may exert a common influence on the behaviors, beliefs, cultures, practices, and attitudes of the
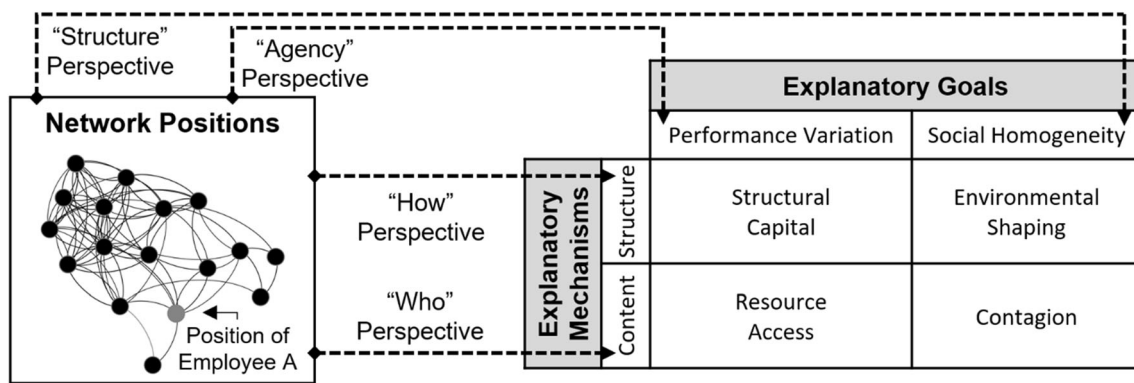
Fig. 2 The relation between network positions and research on the consequences of network positions

employees in such positions. Resource access addresses how and why employees in specific network positions can actively benefit from or be disadvantaged by the specific content accessible through the ties maintained with specific other employees in their position. Contagion addresses how and why the specific content received through the ties maintained with specific other employees in their network positions may exert a common influence on the behaviors, beliefs, cultures, practices, and attitudes of the employees in such positions.

The four essential ESM network characteristics resulting from the underlying ESM (Sect. 2.1) influence the consequences of being part of ESM networks. The "network transparency" and "search and privacy" characteristics promote performance variations in ESM networks (Kane et al. 2014). Employees can actively exploit the network transparency characteristic to manipulate their structural capital. In the same vein, employees can actively exploit the search and privacy characteristic to manipulate resource access. Moreover, depending on the design of the underlying ESM, an ESM network's "relational ties" and "digital profiles" characteristics can induce social homogeneity in ESM networks (Kane et al. 2014). ESM designers can configure the ESM to promote specific network structures that foster favorable behaviors. Similarly, ESM designers can constrain the quantity and type of details available in an employee's digital profile, thus shaping how the employee's alters (i.e., other employees that maintain ESM-enabled ties with the employee) are influenced by the content presented in this profile. Hence, the consequences employees experience from specific ESM network positions cannot be examined completely detached from the underlying ESM.

3 Methodology

We used a literature review and research agenda methodology guided by vom Brocke et al. (2009, 2015), applied to the ESM context (Schötteler 2022). It followed these steps: (1) defining literature inclusion criteria, (2) literature sources selection, (3) database selection, (4) keyword list definition, (5) database querying, (6) forward and backward search, (7) literature review synthesis, and (8) research agenda deduction. These steps are described in the following.

First, four inclusion criteria were defined (Step 1) (vom Brocke et al. 2015; Schötteler 2022). Congruent with our paper's focus, we considered only empirical literature concerning the employee level. It had to–explicitly or implicitly–implement a social network research approach (Wasserman and Faust 1994) to identify how specific ESM network positions lead to specific consequences for employees. Second, we considered only empirical literature that explicitly named or implicitly revealed the specific consequence research type and ESM network layer (Sect. 2.2). Third, only literature published in 2004 or later was considered, as the first empirical literature on ESM appeared at this time (Wehner et al. 2017). Lastly, to increase the validity of the findings, only peer-reviewed literature was considered. As ESM is a rather global phenomenon (Wehner et al. 2017), we refrained from geographical exclusions. Also, we did not exclude literature published in conference proceedings, as conferences provide an efficient means to exchange new findings in such a young research area (Wehner et al. 2017).

We then selected suitable literature sources (Step 2) (vom Brocke et al. 2009; Schötteler 2022). We relied on the eight literature sources named in the Association for Information Systems (AIS) Senior Scholars' Basket of Eight, as our study's focus was similar to theirs, which was behavioral and business-oriented information systems research (AIS 2011). Moreover, because ESM network

research findings are published in the four main AIS conference proceedings (Berger et al. 2014a), we enriched our initial selection through these literature sources. Lastly, we enriched our selection by adding the 12 most relevant ESM sources reported by Wehner et al. (2017), five of which had already been identified in the two aforementioned steps. In summary, the following literature sources were selected. Journals: (1) BISE, (2) EJIS, (3) I&M, (4) ISJ, (5) ISR, (6) JAIS, (7) JIT, (8) JMIS, (9) JSIS, and (10) MISQ. Conference proceedings: (1) ACIS, (2) AMCIS, (3) CHI, (4) CSCW, (5) ECIS, (6) ECSM, (7) HICSS, (8) ICIS, and (9) PACIS.

Overall, 10 journals and nine proceedings were selected for a total of 19 literature sources. All sources are peer-reviewed, thus satisfying the fourth inclusion criterion of Step 1. Next, we selected a suitable database (Step 3) (vom Brocke et al. 2009). Specifically, various multidisciplinary research databases were evaluated for their search coverage, search reproducibility (Gusenbauer and Haddaway 2019), and methodological suitability to screen selected sources. Scopus (http://www.scopus.com) was selected as it met all criteria.

We then defined our keyword list (Step 4) (vom Brocke et al. 2009; Schötteler 2022). This list contained the keyword for ESM, including synonyms and plural forms (i.e., "enterprise social media", "enterprise social software", and "enterprise social network(s)") (Sect. 2.1). It also contained keywords reflecting underlying ESM functions, including simplified and plural forms (i.e., "enterprise social network(s)", "wiki(s)", "enterprise wiki(s)", "blog(s)", and "enterprise blog(s)") (Sect. 2.1). The keyword list was then used to design a database query to derive literature from the chosen sources and database (Step 5) (vom Brocke et al. 2009). The query[1] was designed to collect papers whose titles, abstracts, or keywords matched at least one of our keywords. Moreover, only literature published in 2004 or later would be selected (Step 1 criterion 3).

This process revealed 703 initial papers. Each paper was then manually evaluated to see if it satisfied the first and second inclusion criterion named in Step 1 by applying a two-step exclusion process. We first scanned the title, abstract, and keywords to exclude papers that did not meet these criteria. Examples of papers excluded were those that did not address ESM (459 exclusions) or did not implement a social network approach (170 exclusions). We then

scanned the bodies of the remaining papers for which the first step of the exclusion process did not clearly indicate whether they matched the first and second literature inclusion criterion and excluded the residual papers that did not match both criteria. By doing so, the initial list of papers was reduced to 41 examined papers. We then studied and systematically documented them in a coding table. This table documented each paper based on its source, publication year, derived literature findings, and addressed consequence research type, among other variables. Some papers revealed more than one finding. To clarify the difference between a paper and a literature finding, the following example is illustrative. From the first paper (Kügler et al. 2015a), we derived two findings, one related to environmental shaping and the other to resource access.

The examined list of papers was then used to conduct a forward and backward search for further relevant literature, respecting the inclusion criteria and considering literature from both inside and outside the information systems discipline (Step 6) (vom Brocke et al. 2009). The forward search was conducted by means of citation analysis. The backward search was executed through a reference analysis. Both analyses were conducted with the help of Scopus. We thus derived 17 additional papers, which we studied together with their findings and documented in our coding table. The final list comprised 62 findings from 58 papers (see Fig. 3 in the Appendix for a quantitative distribution of the literature findings). Each paper included in this list is marked accordingly in the references section. To verify the validity of the final list, two authors performed an interrater reliability test based on Gwets's coefficient (Gwet 2014; Nili et al. 2020). The resulting value of 0.93 shows a high agreement between the authors (Gwet 2014). Because we considered only empirical literature derived from a specific database query and a forward and backward search, the final list has a representative rather than an exhaustive coverage (Cooper 1988).

Following other literature reviews (e.g., Dittes and Smolnik 2017; Schötteler 2022), we then applied qualitative research techniques (Corbin and Strauss 1990) to code the findings in the coding table. We first carefully separated each finding into the addressed ESM network position (e.g., having strong ties), underlying layer (e.g., interaction layer), and resulting employee consequence (e.g., increased job performance). Then, we grouped synonymous positions and consequences. Next, we abstracted these groups into distinct positions and consequences. Following Webster and Watson (2002), we then documented each position and consequence into a concept matrix and defined the links between them, including the underlying layer. Doing so also revealed the underlying consequence research type (Sect. 2.1) of each link. We then used the matrix to

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[1] Exemplary Scopus query for the BISE literature source: TITLE-ABS-KEY ("enterprise social media" OR "enterprise social software" OR "enterprise social network" OR "enterprise social networks" OR "wiki" OR "wikis" OR "enterprise wiki" OR "enterprise wikis" OR "blog" OR "blogs" OR "enterprise blog" OR "enterprise blogs") AND SRCTITLE ("Business and Information Systems Engineering") AND PUBYEAR > 2003.

synthesize the literature into a literature review (Step 7). Lastly, we juxtaposed identified research gaps in our matrix and literature review with trends in relevant research streams to arrive at an agenda (Step 8).

4 Results

4.1 Literature Review

Table 1 illustrates the synthesized ESM network positions across the explanatory mechanisms "structure" and "content". It also displays how the positions impact the synthesized employee consequences across the explanatory goals "performance variation" and "social homogeneity". It further reveals the underlying network layer of each synthesized position-consequence link. For instance, row (2) illustrates that occupying a network position with a bonding structure in an interaction network can increase performance. We derived 40 position-consequence links resulting from five network positions and 16 consequences. Precisely, we derived 11 structural capital, six environmental shaping, six resource access, and 17 contagion links. Note that rows (2) and (3) aggregate the links presented in the rows (2a) to (2b) and (3a) to (3b), respectively.

(1) Centrality refers to the number of ties an employee maintains in a network position. It can be further differentiated into indegree, outdegree, and intra-team centrality. The former two are used to differentiate centrality based on the direction of the ties. The latter refers to centrality within team boundaries. Having high centralities of all three kinds in the interaction layer can increase job performance, mainly because the established interaction ties can be strategically leveraged to efficiently access and diffuse information when necessary (Lu et al. 2015; Suh and Bock 2015). Hence, the abovementioned relation may be mediated by the increased potential to manipulate knowledge flows in the flow layer of the ESM network. This assumption is reaffirmed by another finding displaying that having high centralities in the interaction or relation layer can be leveraged by employees to access relevant knowledge more efficiently via corresponding flow ties (Pahlke 2012; Beck et al. 2014). In this context, reciprocity may moderate the relation between interaction layer centralities and flow layer knowledge access. More precisely, if a large number of an employee's interaction ties are reciprocated by their alters, the quality of accessible knowledge via the corresponding flow ties may increase due to moral obligations (Beck et al. 2014). However, having high centralities can also have negative side-effects in other layers. For instance, having high centralities in the relation layer can reduce one's own level of assessment in the organization (i.e., how one is assessed by other employees using the ESM). This relation may be due to connecting behavior being highly visible as a result of the visibility affordance of ESM but not yet valued in organizations (Mark et al. 2014).

(2) Bonding and (3) bridging structures describe two *seemingly* contradicting network positions. Employees are positioned in bonding structures when they share (2a) strong ties with other employees. Strong ties commonly emerge in (2b) cohesive network clusters (Burt 1992; Riemer et al. 2015). Employees are positioned in bridging structures when they share (3a) weak ties with other employees. Weak ties commonly emerge at (3b) structural holes to broker between network clusters (Burt 1992; Riemer et al. 2015). Being positioned in bridging or bonding structures in the interaction layer can increase job performance, likely due to better access to knowledge (Bertoni et al. 2012; Pahlke 2012; Kügler et al. 2015b; Suh and Bock 2015). However, content visibility can moderate this relation for bridging structures. In general, being positioned in bridging structures in the interaction layer can lead to increased participation in idea generation (van Osch and Bulgurcu 2020) and structural autonomy (Kolari et al. 2007; Berger et al. 2014b; Recker and Lekse 2015). This autonomy can be applied to leverage one's interaction ties to gain better access to non-redundant knowledge via associated flow ties (Jackson et al. 2007). However, when the visibility of the knowledge published in the underlying ESM is high, employees do not necessarily have to leverage their interaction ties to access knowledge through associated flow ties. In this case, employees may be able to establish the flow ties without any preceding interaction ties by using ESM features (e.g., search bars). Hence, being positioned in bridging structures in the interaction layer does not always imply higher job performance compared to the employees that do not maintain such positions (Riemer et al. 2015).

Being positioned in bonding structures in the interaction layer can increase own ESM usage (Sun and Shang 2014) and job satisfaction (Fu et al. 2019), mediated by shared visions and trust. Also, being positioned in relation layer bonding structures can increase participation in idea generation (van Osch and Bulgurcu 2020). Furthermore, being positioned in relation and interaction layer bonding structures can increase access to meta-knowledge about who-knows-whom and who-know-what (Engelbrecht et al. 2019). However, such a position can have negative side-effects. For instance, employees positioned in interaction layer bonding structures may subconsciously suppress others from being integrated into such structures (e.g., due to lacking trust or commonalities) (Liao et al. 2011). This "exclusion of outsiders" can also be often found in other social network types (Shin 2021). In this context, ESM

Table 1 Concept matrix

	(a) Performance	(b) Overload	(c) Structural autonomy	(d) Knowledge access	(e) Socialization success	(f) Own assessment	(g) Perceived connectedness	(h) ESM usage	(i) Disruptive behavior	(j) Idea generation	(k) Knowledge exchange	(l) Perceived ESM value	(m) Satisfaction	(n) Impression shaping	(o) Affective commitment	(p) ESM representation
(1) Centrality	+			+	+	−										
(2) Bonding structure	+			+	+ / −			+	+		+		+			
(2a) Strong ties	+							+								
(2b) Cohesive clusters	+			+	+ / −				+		+		+			
(3) Bridging structure	0		+	+					+	+						
(3a) Weak ties	0			+												
(3b) Structural holes	0		+						+	+						
Consequence research type	Structural capital (∑: 11)						Environmental shaping (∑: 6)									
(4) Work-related ties	+	−		+			+	+	−		+	+	+	+		+
(5) Non-work-related ties	+	−				0	+	+	−		+	+	+	+	+	+
Consequence research type	Resource access (∑: 6)						Contagion (∑: 17)									

Legend:

Performance variation links
+: Achievable benefit
−: Negative side-effect
0: Inconclusive effect

Social homogeneity links
+: Reinforcing influence
−: Inhibiting influence
0: Inconclusive effect

ESM network layers per cell
(I) Proximity   (II) Relation
(III) Interaction   (IV) Flow

(Row group labels: ESM network positions — Structure: rows 1–3b; Content: rows 4–5.)
(Column group headers: Employee consequences — Performance variation: columns a–f; Social homogeneity: columns g–p.)

usually enable employees within ESM groups to restrict group visibility. This strategic "exclusion of outsiders" can reinforce bonding structures within the ESM groups (van Osch and Steinfield 2018). New employees mainly positioned in interaction layer bonding structures may experience lower socialization success, as they may lack the social norms needed to socialize efficiently within such structures (Hüllmann and Kroll 2018). Employees in interaction layer bridging structures may be more prone to engage in cyberbullying, as being positioned in such structures can positively moderate the relation between low self-control and cyberbullying (Zhang et al. 2021).

(4) Work-related and (5) non-work-related ties refer to the extent to which employees maintain such ties to specific other employees in their network positions. Work-related ties are flow ties conveying content related to the job, such as knowledge or instructions. Non-work-related ties are flow ties conveying content of self-expression, such as leisure information or emotions. Interestingly, similar consequences can result from having ties of either type. Having ties of either type with employees regularly providing qualitative and relevant content can increase job performance (Ali-Hassan et al. 2015; Johri 2015; Kügler et al. 2015a; Alahmad et al. 2018; Bhatti et al. 2018; Chen et al. 2019) and job satisfaction (Alahmad et al. 2018). Having ties of either type with employees regularly providing qualitative and relevant content can also increase an employee's ESM usage (Brzozowski et al. 2009; Dugan et al. 2010; Geyer and Dugan 2010; Wattal et al. 2010; Arazy and Gellatly 2012; Singh et al. 2014; Kayhan 2015; Chin et al. 2020), often mediated by perceived ESM value (Mäntymäki and Riemer 2014; Chin et al. 2015a, b, c). For instance, if an employee maintains work-related ties with ESM promoters that regularly provide valuable content demonstrating the benefits of ESM, the employee may be more inclined to use the ESM (Alarifi et al. 2015). In contrast, if an employee has work-related ties with self-promoters that very frequently provide irrelevant self-promotional content, the employee may be less inclined to use the ESM (van Osch et al. 2016). The content received through both tie types also forms the impressions of the recipients toward content providers (Holtzblatt et al. 2010;

Huang et al. 2010; Paul et al. 2014). For instance, ESM groups can establish work-related ties with managers to generate favorable impressions (van Osch and Steinfield 2013). Such impressions can further influence with whom the content recipients prefer to collaborate in the ESM (Beck et al. 2014; Wiesneth 2016; Cummings and Dennis 2018). Such impressions can further influence one's self-representation via digital profiles, which in turn can influence the self-representation of further employees (Geyer et al. 2008). In line with critical mass theory (Kügler et al. 2015a), having ties of either type with employees who regularly provide content can increase one's ESM usage (Wattal et al. 2009, 2010; Luo et al. 2011, 2015; Alarifi and Sedera 2013; Iglesias-Pradas et al. 2015; Giermindl et al. 2017; Kalra and Baral 2019; Scarso and Bolisani 2020) mediated by perceived ESM value (Chin et al. 2015a, b, c). Furthermore, having ties of either type with employees regularly providing content can reduce one's cyberslacking (Nivedhitha and Manzoor 2020) and increase one's perceived social connectedness (Kügler et al. 2015a). However, having ties of either type with employees providing much content can lead to overload (Chen and Wei 2019). Hence, employees should use filter features to prevent strain caused by overload (Chen and Wei 2019).

Some consequences are associated with one tie type only. Having work-related ties with knowledgeable employees can increase job performance mediated by better access to meta-knowledge (Giermindl et al. 2018). Having non-work-related ties can increase one's affective commitment to the organization (Luo et al. 2018). Non-work-related ties conveying paralinguistic cues such as likes can reduce cyberslacking due to affectional bonds (Nivedhitha and Manzoor 2020). However, receiving such cues has little impact on socialization success, as they are not sufficient to form deeper relationships (Hüllmann and Kroll 2018).

4.2 Research Agenda

Exploring which employee consequences result from which network positions is the subject of empirical research. Exploring how ESM can be modified to foster fruitful network positions is the subject of design science research. In this vein, the agenda addresses three empirical and one design science research gap.

How does the co-existence of various ESM network layers impact certain consequences? Most of the literature findings focused on one network layer only. However, ESM networks are multilayered (Kane et al. 2014). Network science recognizes that the study of multiple layers and their relations can be a fruitful approach for generating novel interesting findings (Kivela et al. 2014). Applying multilayer social network research to ESM networks could

be fruitful too, as it would make it possible to explore how the co-existence of various network layers impacts certain consequences. For instance, researchers could explore whether two specific network positions in different layers that contribute toward one specific beneficial consequence complement each other (Kane et al. 2014). As an example, we found that being positioned in cohesive clusters in the interaction layer can increase job performance. Researchers could explore whether having such a position in the relation layer yields similar consequences, and if so, whether both network positions together lead to greater benefits than those derived from each of the positions alone. Table 1 could be a good starting point for research in this area. Thus, we propose: *Future research endeavors could apply multilayer network research to explore how the co-existence of various network layers impacts certain consequences.*

Which positions can lead to certain negative consequences? Most of the literature findings addressed positive consequences resulting from specific ESM network positions. Conversely, social network research increasingly focuses on the negative consequences of specific social network positions, often referred to as the "dark side". For instance, Wise (2014) determined that too low or high cohesion in e-mail networks can lead to reduced team performance. Research has already started to focus on the negative consequences of ESM for employees (e.g., Sun et al. 2021). However, research that explores if, and if so, how and why such consequences vary depending on specific ESM network positions is lacking. Thus, a starting point for future research could be to review identified negative consequences in the literature and to explore if, and if so, how and why some of them vary depending on certain network positions. In general, more findings concerning the "dark side" could be used to conduct technical or organizational measures to avoid unfavorable positions. Thus, we propose: *Future research endeavors could focus on the "dark side" of ESM network positions to explore how specific positions can have certain negative consequences for employees.*

How does the interplay of structure and content impact certain consequences? Most of the literature findings addressed either structure or content, but not both. In general, ESM network research that combines both explanatory mechanisms is sparse (see Suh and Bock 2015; Meske et al. 2019 for some examples). Conversely, combining both explanatory mechanisms seems promising (Borgatti and Foster 2003). For instance, our literature review revealed that employees in cohesive ESM network clusters and employees with work-related or non-work-related ties can exploit their positions to increase their job performance. Hence, it may be interesting to explore whether being an employee in a cohesive cluster in a work-

related or non-work-related ESM network can be better exploited to increase job performance. As a starting point, researchers could apply established tools (Riemer et al. 2018) to collect ESM networks and analyze the exchanged content in the ties via content, sentiment, or genre analysis or text mining (Behrendt et al. 2014). Thus, we propose: *Future research endeavors could combine structure and content to explore more precisely how specific positions can lead to certain consequences for employees.*

How can digital nudges in ESM foster favorable positions? ESM design influences how employees connect and interact in ESM networks (Kane et al. 2014). ESM designers can use this knowledge to foster favorable network positions. One way how ESM designers can influence employees toward maintaining favorable network positions is via digital nudges. For instance, in line with default option nudges (Caraban et al. 2019), new employees could be automatically assigned to specific content (e.g., onboarding content) and employees (e.g., onboarding managers), resulting in ESM network positions that increase socialization success. Further, in line with salience nudges (Caraban et al. 2019), ESM designers could configure ESM recommenders in such a way that they emphasize recommended contacts or content promoting potentially favorable positions, such as bridging positions that may foster access to non-redundant knowledge. Overall, ESM should be designed in such a way that favorable employee positions ins ESM networks emerge, and digital nudges seem to offer promising possibilities to do so. As a starting point, future studies could juxtapose established digital nudges (Caraban et al. 2019) with common ESM features to generate new artifacts through design science research. Thus, we propose: *Future research endeavors could focus on designing digital nudges in ESM that foster favorable ESM network positions for employees.*

5 Discussion

The literature synthesis across various dimensions provides a more holistic view of the consequences of ESM networks for employees based on their positions. In the following, the derived implications are discussed.

5.1 Theoretical Implications

First, our study suggests that ESM affordances can influence the consequences employees experience from their network positions. For instance, employees in bridging structures or possessing high centralities in the interaction layer may experience increased job performance compared to employees who do not occupy such positions due to better access to relevant knowledge via associated flow ties (Table 1). However, when visibility (Treem and Leonardi 2012) is high, employees may be able to establish flow ties conveying relevant knowledge without preceding interaction ties (e.g., by using search bars) (Riemer et al. 2015). As a result, the additional benefit from maintaining the aforementioned network positions in the interaction layer may diminish. In general, this decoupling of the flow and interaction layer (Kane et al. 2014) enabled through the visibility affordance may reduce inequality in ESM networks. Many social networks are prone to inequality, as not all actors can establish network positions that provide valuable resources via flow ties (Lin 2000). However, the visibility affordance of ESM paired with common ESM features considerably increases an employee's power to establish flow ties in ESM networks, such that employees can access relevant content visible in the ESM more easily. Therefore, one main predictor for performance variations between employees in ESM networks may actually be the differences in the employees' abilities and motivations to use the underlying ESM features to establish flow ties. In summary, unlike various other types of social networks, many resources in ESM networks are often not only available to a set of selected actors but can–in principle–be accessed by everyone using the ESM. This is in line with past studies arguing that ESM may be able to transform organizational knowledge from a private asset bound to few employees to a public good available to all employees using the ESM (McAfee 2006).

Second, our study suggests that ESM networks can be applied to cultivate bonding, bridging, and linking social capital, leading to performance variations between the employees who cultivate such social capital and those who do not. Bonding and bridging social capital refers to the benefits that employees can leverage from being positioned in bonding or bridging structures, respectively (Adler and Kwon 2002). Linking social capital refers to the benefits that employees can leverage from having work-related or non-work-related ties with employees who have relative power over them (e.g., supervisors) (Page-Tan 2021). Our study suggests that linking social capital may be less researched in ESM networks than bonding and bridging social capital–a trend that can also be observed in other research areas (Manzano Nunez 2016). Hence, the relevance of linking social capital in ESM networks is inconclusive. On the one hand, studies observed that–in hierarchical organizations–employees using ESM preferably establish ties with other employees at the same hierarchical levels at the expense of employees at different levels (Behrendt et al. 2015). This behavior may lower the emergence of network positions associated with linking social capital in the first place, decreasing the relevance of linking social capital in ESM networks. On the other hand,

past conceptual studies argued that linking social capital may be relevant and work both ways in ESM networks (i.e., top-down and bottom-up). For instance, supervisors may strategically seek work-related ties with employees at lower hierarchical levels to understand the organization's informal information economy (Leonardi et al. 2013). All in all, ESM networks enable establishing network positions associated with bonding, bridging, and linking social capital. However, the relevance and resulting consequences of the latter are inconclusive.

Third, the distribution of the position-consequence links in Table 1 along the dimensions "structure" and "content" provides insights into the relevance of flow ties in ESM networks. The majority of links could be found in the "content" dimension. Moreover, various consequences resulting from network positions categorized in the "structure" dimension seem to be mediated by content received via flow ties. For instance, our review revealed that having high centralities in the interaction layer can increase an employee's job performance, as holding such network positions makes it possible to access organizational knowledge through associated flow ties more efficiently (Lu et al. 2015; Suh and Bock 2015). Against this backdrop, the distribution of the position-consequence links suggests that the flow layer may be the main driver of the consequences that employees experience in ESM networks, with the other layers facilitating content access in the flow layer. For instance, joining ESM groups (proximity layer) can provide access to content shared in the groups (flow layer). Similarly, following other employees (relation layer) can provide access to content published by the employees followed (flow layer). Hence, concerning ESM network consequences, the "content" dimension seems to be more relevant than the "structure" dimension", a fact that is congruent with a major goal of ESM, namely facilitating knowledge transfer (Leonardi et al. 2013). This does not mean that researchers should disregard the proximity, relation, and interaction layers when they explore content diffusion in ESM networks. In fact, such layers can be valid approximations of content diffusion (Trier and Richter 2015). However, such layers may be unable to capture the entirety of content flows.

Last, the distribution of the position-consequence links across the dimensions "performance variation" and "social homogeneity" reveals the presence of both agency and structure (Barker 2003) in ESM networks. On the one hand, employees can leverage ESM networks to yield benefits, which is in line with the newly proposed theory of "purposeful feature utilization" (Weiler et al. 2022). This theory posits that employees must not only possess an efficacious networking tool, but must also intend to exploit it. Conversely, ESM networks constrain the employees' behaviors, beliefs, cultures, practices, and attitudes. In this vein, our review revealed some examples of how the ESM network characteristics (Sect. 2.2) can foster performance variation. For instance, employees can establish private groups (van Osch and Steinfield 2018) to leverage the "search and privacy" characteristic of ESM networks and manipulate the content others can access. Doing so can foster performance variations between group members and non-group members. Additionally, our review revealed some examples of how the ESM network characteristics can lead to social homogeneity. For instance, enabling paralinguistic cues such as likes can reduce overall cyberslacking tendencies in ESM (Nivedhitha and Manzoor 2020), thus promoting social homogeneity among employees.

5.2 Practical Implications

Our research has implications for ESM managers and employees using ESM. First, ESM managers sometimes prohibit non-work-related ties, as they fear negative consequences (Luo et al. 2018). Our review revealed that these worries may be unfounded, as non-work-related ties are associated with positive consequences similar to those of work-related ties, albeit for sometimes different reasons. For instance, having work-related ties with other employees who provide valuable content can increase job performance as it enables the access to necessary knowledge (Chen et al. 2019). Conversely, having non-work-related ties with other employees indicates social communication and emotional intimacy that may generate friendship. Friends can offer the support needed to solve problems (Chen et al. 2019). Overall, we recommend managers to allow non-work-related ties at least to a certain extent. However, managers should consider that allowing non-work-related ties next to work-related ties can expose employees to higher overload (Chen and Wei 2019). Hence, we concur with past findings (Chen and Wei 2019) and recommend managers to ensure that effective filtering features are available (e.g., content recommenders) before allowing non-work-related ties. Such features would enable employees to better manage their work-related and non-work-related ties.

Second, ESM managers may consider applying interventions to foster beneficial network positions as presented in Table 1. Given the organizational context, the way how employees position themselves in organizational social networks can be regulated through organizational interventions. Moreover, ESM managers have an additional intervention layer. The ESM networks' underlying ESM are technical artifacts that can be modified to influence the network positions emerging in the networks (Kane et al. 2014). For instance, managers could define an upper limit of ESM groups and employees that a focal employee can

join and follow, respectively. Doing so could nudge employees to join groups and follow employees more selectively, thus reducing overload effects. As another example, managers could implement gamification artifacts (Kügler et al. 2015a) targeted to foster weak relation ties between employees positioned in different cohesive clusters. This could position employees in bridging structures that increase their access to non-redundant knowledge via corresponding flow ties. Conveniently, guidelines (Behrendt et al. 2014) and tools (Riemer et al. 2018) exist that aid ESM managers in conducting and evaluating such interventions.

Third, we propose that employees using the ESM should act as rational agents (Borgatti and Foster 2003) who strategically shape their positions in the underlying ESM network to yield desired benefits. What constitutes a "desired" network position for an employee can be rather context-sensitive and may depend on factors such as business function and hierarchical level. However, because the accruable benefits cannot be derived from a single network position, we recommend employees using ESM to become variety seekers (Erickson 2003), such that their position merges various of the positions displayed in Table 1. For instance, employees may interact frequently in few selected closed ESM groups to position themselves in bonding structures (Riemer et al. 2015) but also infrequently interact in various further closed ESM groups such that the employees are also positioned in bridging structures. As another example, employees could strengthen already established ties with other employees but also create new weak ties to formerly unknown employees (which may strengthen over time). Overall, seeking variety should aid employees in maximizing their range of beneficial consequences that result from their network positions.

5.3 Limitations

Our literature review has only captured the body of relevant literature for a specific period. This limitation is intensified by the fact that research on ESM and ESM networks is relatively young, leading to a constant flux that will probably yield various novel findings in the coming years (Wehner et al. 2017). Moreover, other researchers could have selected other inclusion criteria or considered papers as relevant where we did not (Dittes and Smolnik 2017). Moreover, we defined the literature sources, research database, and database query beforehand. Hence, our literature review has a representative but not an

exhaustive character (Cooper 1988). This can limit the significance and generalizability of our findings. However, this limitation is partly mitigated by our forward and backward search. In general, we call for future studies to extend our literature review with additional literature sources from other areas (e.g., management and sociology). Another limitation was that a few authors contributed to several of the papers we reviewed. Hence, many of our literature findings can be attributed to the same few authors. This could have influenced our findings in certain directions (Wehner et al. 2017), for instance, by impeding the identification of conflicting findings. Lastly, it should be noted that the research agenda probably does not reveal all gaps in this research area. Future studies could extend the current research agenda by intriguing new research endeavors.

6 Conclusion

The goal of this paper was twofold. The first goal was to review literature on the consequences of ESM networks for employees depending on their network positions, addressing RQ1. The second goal was to establish a research agenda to further advance this topic, addressing RQ2. To achieve these goals, we adopted the methodology from vom Brocke et al. (2009, 2015). The resulting literature review synthesized the 62 literature findings derived from 58 papers with the help of a concept matrix (Webster and Watson 2002). This matrix summarized five network positions that influence 16 consequences. We then juxtaposed the identified research gaps in our literature review with trends in relevant research streams to infer an agenda containing four propositions for further research. Thereupon, this paper's implications for theory and practice were discussed. In general, our paper emphasizes that the consequences that employees experience from ESM are not uniform but largely depend on the employees' specific positions in the underlying ESM networks, which ESM managers but also employees using the ESM can influence.

Appendix

See Fig. 3.

Year*	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
■ Structural Capital	0	0	0	2	0	0	0	0	2	0	3	5	0	0	1	1	0	0	14
■ Resource Access	0	0	0	0	0	0	0	0	0	0	0	3	0	0	4	2	0	0	9
▨ Environmental Shaping	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	1	5
▢ Contagion	0	0	0	0	1	2	5	1	1	2	4	7	2	2	3	1	3	0	34
Total	0	0	0	2	1	2	5	2	3	2	8	15	2	2	8	5	4	1	62

Distribution of the findings concerning explanatory goals: 23 performance variation and 39 social homogeneity findings
Distribution of the findings concerning explanatory mechanisms: 19 structure and 43 content findings
Distribution of the literature findings concerning outlet type: 28 journal and 34 conference findings
* The annual distribution concerns publication years and does not account for the duration of the research and publication processes

Fig. 3 Quantitative distribution of the literature findings

References

Each reference discovered in the systematic literature search is marked as structural capital (S), environmental shaping (E), resource access (R), or contagion (C) depending on the type of derived findings.

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