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Enhancing Peripheral Vision through Social Media Use: A Social Network Perspective

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ABSTRACT

In today's highly dynamic and uncertain environment, peripheral vision is critical for organizational survival and prosperity. In accessing complex and ambiguous information, managers often resort to personal sources. While IT is found to improve the quality and quantity of information from well-structured databases and knowledge systems, its role in facilitating access of personal information is less clear. This paper examines how social media use impacts on managers' social networks and thereby gives them competitive advantages in peripheral vision. We propose that active social media use can improve managers' position in the network and strengthen the social relationships with their contacts, which then grant them a set of informational benefits. These informational benefits further help enhance managers' peripheral vision.

Keywords

Social media, peripheral vision, social network, social capital.

INTRODUCTION

The contemporary business environment is increasingly complex and volatile. For organizations to survive and thrive, peripheral vision (PV), i.e. managers' ability to watch and assess emergent trends and phenomena through broadening their scope of observation for early weak signals that implicate potential threats and opportunities, becomes increasingly important (Day and Schoemaker 2006). Proactive attention to the periphery provides opportunities for learning and innovation, and helps defuse small problems before they become major crises (Cunha and Chia 2007). Despite its great importance, there is a striking lack of PV in organizations (Day and Schoemaker 2006).

Previous business intelligence (BI) research has taken a data-centric design science approach and focused on fact-based support systems that rely heavily on advanced data collection, extraction, and analysis technologies (Watson 2009). These systems are internal-oriented and facilitate search towards well-defined problem domains. However, it is argued that the externally-scanned ambiguous information from business periphery can only become comprehensible knowledge through the collaboration, narration and improvisation of local communities (Brown 2004). Hence, it remains unclear whether IT can contribute to enhancing PV and how.

In recent years, Internet-based IT applications built on Web 2.0, such as collaborative projects (e.g., Wikipedia), blogs, content communities (e.g., YouTube), social networking sites, are increasingly popular. These applications, allowing the creation and exchange of User Generated Content (UGC), are commonly referred to as social media (Kaplan and Haenlein 2010). Due to its popularity, an immense amount of UGC regarding competitors, customers, industry, and other general business environments becomes publicly available. This has transformed the way contemporary businesses gather, communicate and transmit competitive information. The purpose of this research is therefore to understand how the use of social media impacts on managerial PV. The central thesis is that social media use improves managers' position in their social networks and strengthens their relationships with existing contacts, thereby giving them a set of informational advantages that are beneficial for enhancing PV.

The paper is organized as follows: We first review relevant literature on peripheral vision to define the concept, and examine existing IS research in this area. Then, we set the theoretical foundation on social capital theory and information quality literature. We further present the research model and hypotheses. Finally, we conclude with contributions to research and practice.

THE NOTION OF PERIPHERAL VISION

The notion of peripheral vision in management literature is analogous to the one in human perception - a critical feature of the eyes to deal with motion and dynamically changing situations with inadequate sensory input. Core internal activities and the continuously monitored external environmental data reflect the organization's efforts to effectively exploit resources in

pursuit of excellence (Day and Schoemaker 2006). Yet, such a concentration of focus and attention can result in overlooking of issues and events at the periphery of the organization's awareness, creating strategic blind spots (Pralhad 2004). Therefore, it is essential for organizations to cultivate awareness regarding areas outside of their focal activities to avoid strategic surprises. Synthesizing existing literature, the notion of PV centers on five key conceptual elements, i.e. the *capability to detect and make sense of an extensive scope of ambiguous information within a short time frame* (Table 1). In this paper, we define PV as the managerial capability to timely detect and make sense of weak signals related to potential threats and opportunities beyond the organizational border.

Conceptual Elements		Keywords	Literature
Capabilities to	Detect	Attend to, surface, detect, awareness of	Menon & Tomkins 2004, Chunha & Chia 2007
	Interpret	Prioritize, integrate, appreciate, recognize	Day & Schoemaker 2006
Object		Weak signals, the hidden/obscured, threat and opportunities, unstructured data	Chunha & Chia 2007, Day & Schoemaker 2006, Menon & Tomkins 2004
Context	Time	Early, before competitors	Menon & Tomkins 2004
	Scope	Distant/other industry, broadening the narrow angle, beyond organizational borders	Day & Schoemaker 2006, Prahalad 2004

Table 1. Conceptual Elements of PV

IT and Peripheral Vision

IT has been suggested as a key factor for enhancing PV (e.g., Day and Schoemaker 2006), but empirical evidence is rare. This may be attributed to the fact that, in accessing information on the periphery, managers tend to resort to human agents rather than technology (Ferriani, Cattani, Baden-Fuller, 2009). Periphery deals with issues that are new, infrequently encountered and open-ended in nature. Without a proper frame of reference, interpreting information from there is difficult. Impersonal information obtained through IT has a broader information bandwidth and higher transmission accuracy. But it lacks the ability of personal sources to filter and reshape the information with regard to the recipient's informational needs and task situation (Choo 2002).

The key difference between social media and traditional BI systems lies in the utilization of collective intelligence, where information and knowledge are collected and co-created by users during their interactions. Typical social media applications include features such as user profiles, publicly articulated friendship, exchange of comments, and many others that support social interactions and the formation of digitally enabled social networks. Social networks act as repositories of information. To the extent that managers occupy heterogeneous positions in the network, their access to information varies. Since better access to information generates greater awareness of available opportunities, differences in network position can partly explain inter-individual variance in the ability to locate lucrative opportunities (Ferriani et al. 2009). Consequently, the value of social media lies to a great extent in facilitating the dynamics through which weak signals are captured, transferred, and their meanings collectively induced through managers' social networks.

Previous IS research find IT facilitating communication, information sharing, and reinforcing social relationships in general (Constant, Sproull and Kiesler, 1994; Siegel, Dubrovsky, Kiesler and McGuire, 1986). However, IT has been mainly treated as a communication medium compared to other forms of media. A holistic understanding of the impact of IT on managers' networks, with respect to advantages in sensing and detecting weak signals is absent. The following section explores the theoretical underpinnings through which social networks accumulate advantages for PV. Subsequently, we provide a set of propositions concerning the role of social media in such a process.

SOCIAL NETWORKS AS SOURCES OF INFORMATIONAL ADVANTAGES

The key proposition in the social network literature is that whom you know affects a great extent what you come to know (Granovetter 1973), because there are resources embedded in the network of relationships among actors. These resources create, for certain individuals or groups, a competitive advantage in pursuing their ends. The sum of these resources is referred to as social capital (Coleman 1988). While it can refer to anything that facilitates individual or collective action, the actual advantages are empirically manifested in many forms. Informational benefit is a key form of social capital, given that the common assumption underneath many social network theories is that network structure determines information channels and therefore the informational benefits the individual or collective possesses, which further determines the socioeconomic attainments (Anderson 2008).

Informational social capital is critical for sharpening PV which requires intensive sense-making and monitoring of large amount of environmental information (Uotila and Melkas 2007). The main informational social capital examined to date is access to information (Anderson 2008). However, what matters most seems not so much on information access *per se* given today’s IT advancement, but rather the nature of information accessed. While relevant and timely information allows managers to make accurate decisions, irrelevant or outdated information can make decision making difficult and confusing (de Alwis and Higgins 2001). By explicitly examining the intermediate mechanisms through which network generates different informational benefits and how these benefits contribute to PV, we shall better understand why one can scan and detect weak signals better than the other.

Informational Social Capital Dimensions

The nature of information has been intensively studied in IQ literature. Many frameworks have been proposed in terms of what it means by information quality. In general, the definitions take either an intrinsic or a contextual view. The former examines the extent to which data values are in conformance with the true values in the real world, and is largely defined in IS as the accuracy of information generated by information systems (Wang and Strong 1996). This perspective, although important, is limited because it treats information in isolation of the context to which it is applied (Nelson, Todd and Wixom, 2005). The latter perspective suggests IQ be defined relative to the user and task (Wang and Strong 1996). This view expands the IQ concept to include dimensions that shape perceptions of quality in the context of use (e.g., relevancy, timeliness, etc.). Representational and accessibility are two other views considered important for assessing overall information quality. The representational view reflects the degree to which information presentation effectively facilitates interpretation and understanding, while accessibility reflects the extent to which data are available or easily and quickly obtainable for users (Wang and Strong 1996). However, there are myriad dimensions that can be considered under each of the above views, and there is little consensus on what constitutes a complete yet parsimonious set of IQ dimensions. Building on past studies, we have distilled a core set of IQ dimensions for our paper (Table 2¹²).

IQ Dimensions		Definition	Literature
Contextual	Relevancy	Extent to which information is applicable to the task at hand	Wang & Strong 1996
	Completeness	Degree to which information is sufficient enough to depict every state of the task at hand	Wang & Strong 1996, Nelson 2005
	Timeliness	Degree to which information is up to date	Wang & Strong 1996, Nelson 2005
	Novelty	Extent to which information is new to the user	Klobas 1995
Representational	Understandability	Extent to which information is easy to understand	Wang & Strong 1996
Accessibility	Accessibility	Extent to which information is easily and quickly obtainable	Wang & Strong 1996

Table 2. IQ Dimensions of Information from Social Networks

SOCIAL MEDIA USE, SOCIAL NETWORK, AND PERIPHERAL VISION

The research model is presented in Figure 1. We propose that social media use will impact on the structure of managers’ social networks in which they share and exchange information. The structural and relational characteristics of the network further determines the types of informational benefits managers have access to, which then can be exploited to enhance PV.

¹ We have excluded IQ dimensions that are specific to information systems but are not pertinent to social networks for each view (e.g., readability, version control, privileges, security, ease of use of H/W, etc.)

² We have excluded intrinsic IQ because peripheral vision involves anticipations and foresights about future events. Since such events never happened yet, it is difficult for managers to access the accuracy of information in terms of how true it represents the real world (Uotila and Melkas 2007).

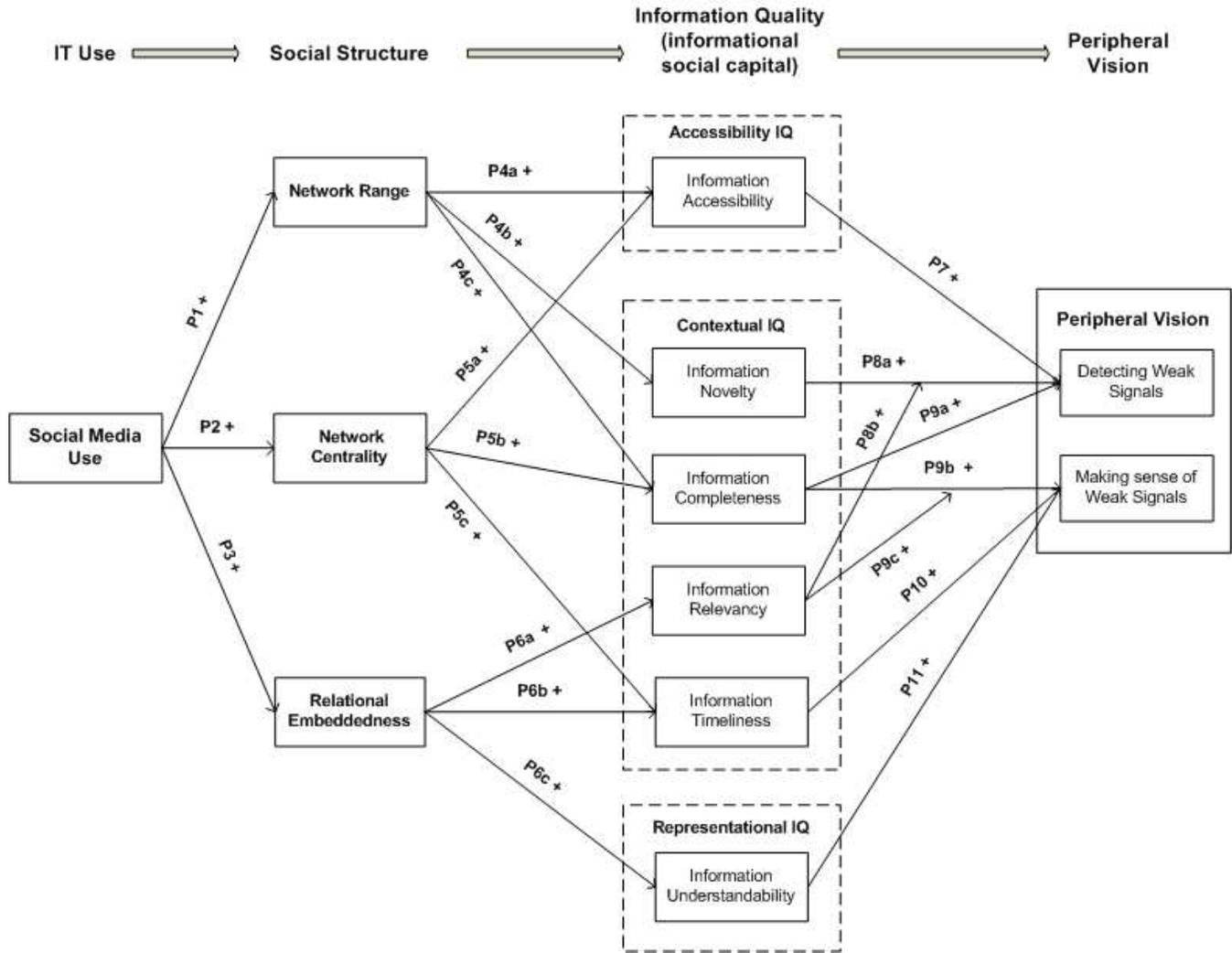


Figure 1. Research Model

Social Media Use and Social Structure

Network range refers to the prevalence of ties that cross institutional, organizational, or social boundaries (Burt 1992). It measures the heterogeneity/diversity of the network. Social media are by design meant to generate and support ad hoc communities and networks that span locales and organizational boundaries (Culnan, McHugh and Zubillaga, 2010). It builds bridging ties by connecting actors to others beyond their immediate environment (e.g., producers and consumers who would otherwise not be able to do business together). By enabling chance encountering of new people across communities (Haythornthwaite 2002), social media provides abundant opportunities for social interactions that facilitate the formation of new ties outside managers’ daily social circle. Hence we argue that more social media use will help managers to build more ties across distant social groups, consequently expanding the range of their social network.

Proposition 1: A manager’s social media use positively contributes to his/her network range.

Centrality measures the extent to which the individual is linked to others in the group. Social media can increase centrality through enlarging an individual’s network size (i.e. degree centrality). Building and maintaining social relationships is costly, as it takes time and energy to search for candidates, initiate the contact, and maintain the relationship (Burt 2005). Yet social media can be used to make new connections more quickly for a less cost and in much greater numbers, because often it just takes a click on a link for a message to be sent with the connection request. Additionally, social networking sites, micro-blogging applications, and blogs all have attributes that allow cross links and enable people to explore and connect to friends’ friends directly. As such, social media reduces managers’ dependence on intermediaries and shortens their average paths to

others in the network, thereby increasing their (closeness) centrality. Furthermore, through facilitating managers to build relationships across functional/organizational boundaries, social media effectively put managers in a strategic position that links the communication paths between disconnected groups, hence also increasing their (betweenness) centrality.

Proposition 2: A manager's social media use positively contributes to his/her network centrality.

Relational embeddedness captures the average strength of all the ties an individual possesses in the network (Granovetter 1973). A strong tie is characterized by trust, identification, reciprocity, fine-grained information exchange and sacrifice of short term economic gain for long-term cooperation (Granovetter 1973). Social media facilitates communication within a community and therefore provides opportunities for more social interaction that enhances the strength of established ties (Hampton 2002). It also makes the maintenance of strong ties across community boundaries much less costly, particularly when communication partners are physically unable to communicate otherwise (Straub and Karahanna 1998). Furthermore, by using social media as a supplement of face-to-face interactions, it reinforces strongly tied pairs as it supports the communication needs and tasks of the pair better (Haythornthwaite 2002). In short, social media use enhances strengths of established ties, thereby increasing the relational embeddedness of the user.

Proposition 3: A manager's social media use positively contributes to his/her relational embeddedness in the network.

Social Structure and Informational Advantages

Informational Social Capital in Network Range

Social relations affect who knows what early because diffusion of information requires channels and an interval of time (Burt 2005). The benefit of a wide network range lies in its access to extended networks of bridges, i.e. ties that cross institutional, organizational, or social boundaries. These bridges function as intermediaries that are pervasive conduits for information and help forge connections (Burt 2005). Therefore, people with wider network range are more likely to know where the information resides. Additionally, a key indicator that measures how efficiently information travels from one node to another is the distance between the two. The shorter the distance the more efficient information travels. Bridges are direct connections with external groups, thus wider network range should have faster access to external information.

Proposition 4a: Network range positively contributes to information accessibility.

Because people on disconnected groups tend to have different mental models and a diverse range of information and knowledge (Seibert, Kraimer and Liden, 2001), researchers find that scientists that broker across otherwise disconnected communities have access to a more diverse body of knowledge (Reagans and McEvily 2003). This diversity enables tapping multiple pockets of information. Hence we argue that managers with a wider network range will have access to a wider breadth and scope of information, covering more aspects of their business environment.

Proposition 4b: Network range positively contributes to information completeness.

A key finding in social network theories is that information circulates more within than between groups: people are likely to have similar information within groups, while those in circles different from our own are more likely to have access to information novel to what we usually receive (Burt 2005). Hence a major information advantage of a wide network range stems from the diversity associated with unconnected ties. These unconnected ties provide managers non-redundant sources of information (Burt 1992). Empirical studies find that employees' contacts from other organizational functions will provide access to information not available within their own functional group (Seibert et al. 2001). Therefore, managers with a wider network range are more likely to obtain information that is novel to their organizational functions.

Proposition 4c: Network range positively contributes to information novelty.

Informational Social Capital in Network Centrality

Network centrality is one of the primary social network variables that have been argued to affect access to information. Being central makes the individual an obligatory passage point for information that is flowing through a network (Freeman 1979). This means that central individuals are better informed about the flow of information in the network, and should be associated with higher ability to obtain relevant information more efficiently and effectively (Mehra, Kilduff and Brass, 2001). Furthermore, a central position in the network signals more status, power, and influence (Ibarra 1993). Consequently, peripheral members tend to be drawn to the central ones in the network. Research finds that high-status firms do not need to conduct industry-wide searches for novel information; rather they can rely upon their partners to bring this information to their attention due to their central position in the network (Al-Laham and Amburgey 2010). Hence, we argue:

Proposition 5a: Network centrality positively contributes to information accessibility.

Network centrality reflects the extent of involvement the individual has with the group (Freeman 1979). As each contact represents an information channel, being central means having access to more contacts and therefore more ideas and information. Research finds that the number of ties an individual has is positively associated with the amount of information s/he has access to (Ahuja, Galletta and Carley, 2003). Moreover, being on a passage point for information can improve managers' alertness towards extant opportunities because it provides a larger base of information, and a richer pool of alternatives to choose from (Ferriani et al. 2009).

Proposition 5b: Network centrality positively contributes to information completeness.

Previous research finds that central firms, at the confluence of information and resource flows, are the first to learn about new market conditions, strategies of competitors, and partnership opportunities (Powell, Koput and Smith-Doerr, 1996). Peripheral members tend to be at a disadvantage in terms of access to timely information circulating within organizations compared with those central ones (Ibarra 1993). Hence we expect that managers that are centrally positioned are also more likely to have access to timely information than peripheral ones.

Proposition 5c: Network centrality positively contributes to information timeliness.

Informational Social Capital in Relational Embeddedness

Strong ties are maintained through frequent and emotionally intense communication. Contact frequency and intimacy of strong ties increase the amount of shared tacit knowledge that partners can accumulate and generate. Hence, strong ties allow two parties to develop shared language and mental schemas (Uzzi 1997). These shared mental schemas function as the knowledge structures against which new information is tested for relevance, and help individuals to recognize connections between seemingly unrelated events and trends (Weick 2005). Given the shared language and knowledge of relevance between the source and the recipient, information obtained through strong-tie contacts is likely to be more relevant to managers.

Proposition 6a: Relational embeddedness positively contributes to information relevancy.

In accessing information that is up to date, it requires detecting the presence of information as soon as it is generated. This is extremely hard when probing the periphery where no pre-defined or well-articulated questions are formulated. However, given the expectations of reciprocally between strong-tie contacts, they would be more willing to act as antennas for each other in terms of looking out for potentially interesting information. Having multiple antennas scanning the periphery for them, managers that are highly embedded in the network will be more likely to catch potentially interesting information in a timely manner. As put in simple words by Coleman (1990): "a person who is interested in being informed about important developments can save the time required to read a newspaper if he can get the information he wants from a friend who pays attention to such matters" (p. 104).

Proposition 6b: Relational embeddedness positively contributes to information timeliness.

Relational embeddedness also contributes to information understandability. Shared mental schemas increase the effectiveness of communication and information exchange (Takahashi 2000). Since strong tie contacts share similar cognitive structures for organizing and interpreting information, information from the strong tie relations is more likely to be presented in an understandable manner, and therefore it shall be easier for them to understand each other (Pérez-Nordtvedt, Babakus and Kedia, 2010). Additionally, strong ties yield richer and more in-depth information-sharing, since a close contact is generally more willing to take the time to carefully explain and discuss about a message if it is unclear to the recipient (Coleman 1988). As such, even if the information presented is initially difficult to understand, it can be resolved through further elaborations from the informants to the information receiver.

Proposition 6c: Relational embeddedness positively contributes to information understandability.

Informational Social Capital and Peripheral Vision

The ability to locate information with speed has a positive impact on PV. In a dynamic environment where change happens fast whilst environments and the organization simultaneously become more complex, it requires more time for effective responses. In order to fulfill these requirements, the organization has to identify the weak signals of change as early as possible (Prahalad 2004). Fast and easy access to information will help managers identify weak signal in a timely manner, as it reduces the time spent in searching and waiting for the information source.

Proposition 7: Information accessibility positively contributes to detecting weak signals.

The key difference between peripheral vision and focal vision is the cultivated sensitivity to what lies outside the frame of conscious attention (Cunha and Chia 2007). This inherent nature requires the information to be collected new to organizations, to cover areas that they traditionally omit, to take into account the distant industry/indirect rivals (Day and Schoemaker 2006). Hence information that's novel to the managers' routine functional obligations and organizational process is helpful in broadening their scope of observation for detecting weak signals on the periphery. However, periphery is not without boundary. The access to a novel body of information contributes to PV only if a manager considers it relevant and is able to make sense of it. Information relevancy towards the organizational context, i.e. its strategic objectives, customers, competitors and suppliers, is necessary for the information to be worthy of pursuit, and is also a prerequisite to initiate the cognitive process of sense-making (Weick 2005). Therefore, we propose:

Proposition 8a: Information novelty positively contributes to detecting weak signals.

Proposition 8b: The positive effect of information novelty on detecting weak signals is stronger for information with higher relevancy.

The idea behind PV is striving for a breadth of view and interpretation of interacting trends. For such an informational task, it is important to scan broadly and comprehensively to include information resources that represent both breadth and volume (Choo 2002). An extensive range of information is required to seize lucrative opportunities for entrepreneurs (Ferriani et al. 2009). Access to complete information that cover sufficient breadth and diversity gives managers a competitive advantage in seeing weak signals beyond the borders of their organizations, industries and geographies, therefore enhances their ability to detect weak signals on the periphery (Prahalad 2004).

Proposition 9a: Information completeness positively contributes to detecting weak signals.

Having access to complete information also helps making sense of the weak signals. Making sense of the large zoom of organizational periphery requires cognitive variety of mental models in processing of the environmental information and capturing signals belonging to diverse content categories (Day and Schoemaker 2006). The multiple perspectives are necessary to better understand the periphery because they will increase the cognitive flexibility in the sense-making process (Bogner and Barr 2000). More diverse perspectives also help managers to connect the dots between seemingly independent events, and increase the likelihood that they understand how to use relevant information located in socially distant regions of a network (Mehra et al. 2001). Empirical studies found that entrepreneurs that have access to heterogeneous information sources attend to their competitive surroundings better and recognize more opportunities than those who have homogeneous ones (Ozgen and Baron 2007). In short, information completeness provides a vision advantage in detecting and developing opportunities and competitive ideas.

However, to the extent that information is being transferred across network boundaries, it is unlikely that individuals of either side of the boundary will have much knowledge in common (Borgatti and Cross 2003). From an absorptive capacity standpoint, this lack of common knowledge is likely to frustrate attempts to transfer knowledge across the boundary (Reagans and McEvily 2003). This is because when the source cannot frame the knowledge in a language that the recipient can understand, comprehending that knowledge can be difficult and therefore costly for the recipient (Borgatti and Cross 2003). Hence we argue that information completeness is moderated by information relevancy to be better comprehended and synthesized for new understandings.

Proposition 9b: Information completeness positively contributes to making sense of the weak signals.

Proposition 9c: The positive effect of information completeness on making sense of weak signals is stronger for information with higher relevancy.

PV entails the critical capability to promptly cope with dynamically changing situations. Researchers have emphasized on the importance of identifying new opportunities before competitors do and spotting threats before it becomes disasters (Menon and Tomkins 2004). Therefore, collecting information about events as soon as they occur is of essential importance in making sense of the environment in a timely manner. Outdated information will make the value of interpretation null and even mislead managers in understanding the environment (Eppler 2006).

Proposition 10: Information timeliness positively contributes to making sense of weak signals.

Understandability of the information exchanged depends on the mutual mental schemas shared between the parties. Schemas are mental frameworks, developed through experience, that help to organize information retained in memory. It is a well-established principle of cognitive science that information that is organized is often more useful than information that is not (Ozgen and Baron 2007). Understandability of information leads to better mastering of the information acquired, and enhances the learning effectiveness (Pérez-Nordtvedt et al. 2010). Thus, it seems reasonable to predict that the more the

information is presented in a way that is in accordance with the managers' mental schemas in a given area, the more effectively they will employ this information to identify opportunities and threats.

Proposition 11: Information understandability positively contributes to making sense of weak signals.

CONCLUSION

This research examines the underlying mechanisms by which social media use creates informational social capital for managers: through improving the position they are located and strengthening their social relationships in the network. We further examined how different informational social capital contributes to PV. We hope to provide theoretical insights into how and why social media use enhances managerial PV. Our model also holds the potential to inform management practice about exploiting social media to obtain better network positions in achieving a shaper PV.

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