Nurturing user creative performance in social media networks

An integration of habit of use with social capital and information exchange theories

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Abstract

Purpose – Creative performance relies on the capability of developing and presenting an original concept or idea, and the collaborative production of creative content which enhances feeling of connection with others and formation of strong community. The purpose of this paper is to apply the theory of work performance containing four dimensions (capacity, opportunities, willingness, and performance) to investigate how the capabilities of social network sites enhance user creative performance through collective social capital and information capital (opportunities) for and individual habit of use (willingness) of the user to engage in social learning process.

Design/methodology/approach – Many measurement items are adapted from the literature, except those measuring the constructs of social media capabilities (i.e. transmission velocity (TV), parallelism, symbol sets, rehearsability, and reprocessability) and user creative performance. The study uses survey method to collect data from social media network (SMN) users in Taiwan. Facebook is chosen as the source because it is the most prevalent and sophisticated social media platform that provides a home for users to interact and communicate. Structural equation modeling with partial least square is used to analyze the usable data collected from 533 Facebook users.

Findings – The results show that the constructs are significantly and positively correlated, meaning that social media capabilities enable social capital, information capital, and habit of use to improve user creative performance in SMNs. Three out of five social media capabilities (i.e. TV, parallelism, and rehearsability) are identified as the key enablers.

Research limitations/implications – Because of the sampled surveyed subjects and the single research method, there are some limitations in this study. The research results may lack generalizability that should be taken into account when they are interpreted. The authors encourage researchers to test the proposed theoretical model further with additional subjects, variables, and linkages.

Practical implications – The findings of this research shed light for managers of SMN platforms on how to manage the platforms more effectively. A healthy SMN platform must implement at least these three media capabilities: the functions of news feed (i.e. TV), chat (i.e. parallelism), edit (i.e. rehearsability), in order to sustain its service.

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Social implications – This study confirmed that user creative performance can be increased in various ways through social capital, information capital, and habit of use. Company management should use SMNs (e.g. Facebook or Twitter) to enable employees to interact and exchange ideas and promote "coopetition" among employees across the company. If the organizational culture supports free expression of ideas and sharing of opinions, the development and robustness of group creativity can be enhanced, leading to higher competitive advantage for a company against its competitors.

Originality/value – Past studies related to individual creativity have mostly discussed it as a personality trait or talent; yet, personality trait or talent is implicit until it is shown by one's behavior. Thus, for the collective performance of user creativity on SMNs, the authors elicit individual creativity through the creative performance manifested by user behavior. Furthermore, the authors confirm that social capital, information capital, and habit of use are the critical antecedents of user creative performance, and that the five social media capabilities are the enablers of social capital, information capital, and habit of use on SMNs.

Keywords Communications, Electronic media, Information exchange, Knowledge sharing, Social networks, Social values

Paper type Research paper

1. Introduction

Social media refer to the interactive platforms generated by mobile and web-based technologies on which individuals and communities can share, co-create, discuss, and modify user-generated content (Kietzmann *et al.*, 2011; Scott and Orlikowski, 2014). Such platforms include collaborative projects, blogs, content communities, social network sites, virtual game worlds, and virtual social worlds (Kaplan and Haenlein, 2010). These kinds of media have advanced continuously throughout the last few decades. The earliest social media such as bulletin board systems started in 1978 and offered pure text content for posting and communication. The new-generation social media in the 1990's allowed users to generate personal content on the World Wide Web (e.g. user forums). Today, social media networks (SMNs), such as Flickr, Facebook, Twitter, Wikipedia, and YouTube, can distribute online user-generated content and increase the number of users participating in web-based collaboration process (Kaplan and Haenlein, 2010). The SMNs help users co-create values through large-scale user participations (McLean *et al.*, 2007) and accumulate group experience and knowledge through social interaction and information exchange behaviors. These sites instigate collectively user creative behavior (e.g. launching online marketing campaigns) and allow many creative ideas to be generated and distributed spontaneously. Such a collaborative production of creative content enhances the feeling of connection with others and strengthens the coherence of a virtual community (Hildebrand *et al.*, 2013), in addition to the formation of a new brand consumption model (Davis *et al.*, 2014). With the development of related technologies, SMNs (e.g. Facebook, LinkedIn) nowadays feature multi-user-generated digital profile, content search and privacy, user-managed relational ties, and user-managed network transparency (Araujo and Neijens, 2012; Ellison and Boyd, 2013; Schoen *et al.*, 2013; Evangelos *et al.*, 2013; Kane *et al.*, 2014). They support a shared pattern of coordinated synchronous behavior among individuals with a common focus when they work together through video conferences, discussion forums, etc. (Dennis *et al.*, 2008). Thus, social media critically influence social learning and creativity among people on today's SMN platforms.

From social learning theory (Bandura, 1963), a user's behavior on an SMN platform is affected by the behaviors of their friends, since they learn from observations in social situations. The SMN platform support all of the necessary steps (attention, retention, reproduction, and motivation) for social learning to happen, particularly when friends'

actions are aggregated in a content feed which allows users to view and recall friends' actions and makes the links to the tools for content contribution more salient (Burke *et al.*, 2009). Based on the interactive model stemming from social learning theory, Blumberg and Pringle (1982) propose a theory of work performance with four dimensions: capacity, willingness, opportunities, and performance.

In the context of this study, capacity of a social media platform refers to the capability of the social media platform that influences social learning behavior, while performance refers to the efficiency and effectiveness of social learning exhibited as an achievement of creative behavior. Researchers have discovered that sufficient knowledge representations must be generated and constructed for mutual understanding and cognitive processing, and that creative performance among individuals can be enhanced through effective learning (Kassim *et al.*, 2014). Next, opportunities are the exogenous forces that leverage social learning resources, such as social capital and information capital since increasing these two capitals among individuals help generate their creativity (Fischer *et al.*, 2004; Florida, 2002). In contrast, willingness is the endogenous force that drives an individual to perform social learning. As a frequently performed behavior tends to become habitual and thus automatic over time (Limayem *et al.*, 2007), a user who is frequently willing to get new ideas and perform a task automatically via an SMN platform will develop a habitual behavior. Such a behavior occurs without self-instruction (Triandis, 1980) and triggers a learning process (Orbell *et al.*, 2001). According to social learning theory, the more a user unconsciously and automatically (habitually) engages in collaborative activities, the more his/her productivity in discovering new knowledge (Bandura, 1977); thus this study adopts habit as a surrogate of individual willingness of social learning.

The SMN platforms have the potential to facilitate communication, interaction, and collaboration, supporting and accelerating the use of social media in the learning contexts (Greenhow *et al.*, 2009). Abundant research exists concerning the determinants of individual job performance, such as abilities, motivation, personality, leadership, and group processes (Waldman and Spangler, 1989; Hogan and Holland, 2003). Yet, little is known about the antecedents of users' creativity exhibited as the behavioral performance on an SMN platform. An extensive review of the extant literature reveals that most businesses are concerned with return on investment of marketing activities on SMN platforms (Hoffman and Fodor, 2010). There is a paucity of research into the performance of SMNs in terms of the crowdsourcing potential (as measured by the degree of user creativity) and how capacity, opportunity, and willingness affect this potential. To effectively foster individual creativity, SMN managers need to be aware that their individual leadership behavior plays a key role in eliciting creativity from a group of users whose knowledge and capabilities are different. Many firms today adopt crowdsourcing strategy to take advantage of social creativity on the SMN platforms. Crowdsourcing or "wisdom of crowds" is the open innovation process of obtaining needed creative services, ideas, or contents by soliciting contributions from an online community (Leimeister *et al.*, 2009). For example, the successful crowdsourcing development models of both Xiaomi.com phone in China (Kan, 2013) and Made.com furniture in UK (Grose, 2010) exemplify the capitalization of the collective designs from consumers through intra-firm SMN platforms. In essence, the success of a crowdsourcing strategy depends on the individual creativity collectively. Individual creativity is the capability of a person in developing new ideas through social learning process (Bandura, 1963). Most previous studies have explored how business firms foster employee creativity in developing new services and products (Lumpkin and

Lichtenstein, 2005; Thatcher and Brown, 2010), business models (Shih, 2009), and decision support systems (Forgionne and Newman, 2007). So far, there is a paucity of research into user creativity in SMN communities. Moreover, those studies related to individual creativity have mostly discussed it as a personality trait or talent (Barron and Harrington, 1981; Davis, 1989; Martindale, 1989); yet, personality trait or talent is implicit until it is shown by one's behavior. As Davis (1989) stated, creativity can be elicited in brainstorming sessions (by exogenous forces) or happen spontaneously (via endogenous force), the same as when poetry, music, or a problem solution "comes alive" in the creative person's mind. Thus, to study the collective performance of user creativity on SMN communities (hereafter called "user creative performance"), one must observe his/her individual creative performance (i.e. creativity manifested as behavioral performance) and identify its antecedents.

Accordingly, the purpose of this study is to apply the theory of work performance to explain user creative performance and examine the relationships among the four dimensional factors: capacity (social media capabilities), willingness (habit of use), opportunities (social capital and information capital), and performance (user creative performance). Specifically, the main research questions are:

RQ1. How do the social media capabilities influence social capital, information capital, and habit of use?

RQ2. How do social capital, information capital, and habit of use influence user creative performance?

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature and proposes research hypotheses. Section 3 explains research design and data analysis. Section 4 discusses the main findings, and the conclusion is drawn in Section 5. Finally, Section 6 provides suggestions for future research.

2. Theoretical framework

2.1 Social learning theory in SMNs

Social learning theory as proposed by Bandura (1963) describes a cognitive process that takes place in a social context and can occur through observation or direct experience (Berkes, 2009). The process contains four necessary steps: attention, i.e., to be able to observe and capture the behavior without distraction; retention, i.e., the need to remember the observed behavior; reproduction, referring to the ability to perform the action of observed behavior; and motivation, including past, promised, or vicarious reinforcement, which influence the learners to reproduce what they have learned (Bandura, 1977; Brown *et al.*, 2005). An individual in a virtual community is not a passive recipient of information; he or she must proactively engage in social learning process. Lam *et al.* (2010) argue that the three critical components in social learning process: cognition, environment, and behavior, all mutually influence each other. The degrees of such influences coming from network connections are primarily determined by the size of network structure in which multiple communities of users are embedded. Hence, users' learning behaviors and their social learning performance on SMNs are influenced by both users' social interactions and their SMN environments.

2.2 Proposing a theoretical model for social learning performance

Of particular interest to this study is the interactive model of work performance proposed by Blumberg and Pringle (1982), taken from the literature on job performance

and social learning theory. The model includes four dimensions: capacity, opportunities, willingness, and performance, as defined in the previous section. In the context of this study, social media need more capacity (capabilities) for immediate and collaborative production of creative content, comparing to traditional communication technologies such as e-mail or bulletin board system. This capacity enables users to process a wide range of information using a variety of functions and to create new knowledge through social learning and social interactions.

The success of an SMN platform lies in its numbers of people and content; the more people and content, the better the service of the platform (O'reilly, 2007). Thus, the opportunities of social learning on an SMN platform can be derived from people and content. Through social interactions with people and social exchange of content, users could accumulate resources such as social capital and information capital. The former resource could be increased by building more social ties, shared understanding, and social trust with fellow SMN users; the latter by identifying, creating, representing, distributing, and utilizing various messages and information. The more the social capital and information capital, the higher the opportunities of social learning.

Regarding willingness, the psychological and emotional characteristics that influence the degree to which an individual is inclined to perform a task comprise this dimension (Blumberg and Pringle, 1982). Prior studies suggest that the users of information systems (IS) tend to habitually use IS as they acquire new knowledge over time (Limayem and Hirt, 2003; Limayem *et al.*, 2007). Such kind of habitual behavior occurs among SMN users as well; it often drives users to stick routinely on SMN platforms. Jones (2002) also points out that habit is an important predictor of network usage behaviors. However, studies of SMNs have mainly focused on usage attitudes and behaviors (Ellison *et al.*, 2007; Boyd and Ellison, 2007; Park *et al.*, 2009) or commercial advertising and marketing behaviors (Shih, 2009).

From the performance perspective, Blumberg and Pringle (1982) argue that all three elements (capacity, opportunity, and willingness) must be present, in some degree, for performance to occur. From the perspective of an SMN user, performance of his/her social learning is influenced by three factors: the capacity of social media, the opportunities from accumulated resources, and the willingness to use social media for enriching collective intelligence that emerges from collaboration, collective efforts, and competition of many users. Previous studies have rarely explored individual creative performance in a group; neither have they probed into the effects of social media capabilities (capacity) on user creative performance (performance) through environmental exogenous force (opportunities) and individual endogenous force (willingness) of social learning. Therefore, we adapt the theory of work performance (Blumberg and Pringle, 1982) to develop a theoretical model (see Figure 1) for explaining the antecedents of user creative performance on SMN platforms. The model allows us to examine how the social media capabilities (capacity) affect social and information capitals (opportunities) as well as habit of use (willingness), and in turn influence user creative performance (performance) on SMN platforms.

3. Literature review and hypotheses

3.1 Social media capabilities

Following the communication theory (Shannon and Weaver, 1949), there are five types of capabilities: capacity, channel, format, encoding, and decoding. Capacity refers to the amount of information; channel is the number of different frequencies; format refers to the symbol types such as voice, text, or emoticon (e.g. ☺, 👍, ^_^); encoding is to process

information for storing into memory or transmitting over the channel; decoding is to process information after retrieving from memory or receiving over the channel. For immediate and collaborative production of creative content, Dennis *et al.* (2008) proposed two individual communication processes: information transmission (preparing information for transmission, transmitting it through a medium, and receiving information from a medium) and information processing (comprehending the meaning of information and integrating it into a mental model), representing the interpersonal and cognitive aspects respectively for shared understanding and information quality. Since communication media vary in their capabilities to support the transmission and processing of information, Dennis *et al.* (2008) adapted Shannon and Weaver's theory and defined five types of media capabilities. The first type, transmission velocity (TV), is defined in terms of "rapid" or "immediate" (as in feedback) and interactivity between the sender and the recipient. A message quickly transmits between the sender and the recipient implying the two parties continuously communicate and exchange information through better coordination and faster feedback. The second type, parallelism (PA), refers to the quantity of simultaneous transmissions, i.e., transmitting messages through the medium simultaneously by multiple senders. The third type, symbol sets (SS), refers to the number of ways in which a medium allows information to be encoded for communication, such as multiplicity of cues and language variety. The media support the use of SS such as texts, emoticons, tables, images, videos, figures, and so on. Rehearsability (RH) refers to the media capability that enables the transmitter to rehearse or fine-tune the encoding of a message before sending. Media provide users with rehearsability to facilitate sender's encoding of the message and enhance the recipient's comprehension level. Lastly, reprocessability (RP) refers to the media capability that enables the receiver to reexamine and reprocess a message during the decoding phase. Storage capability of the media allows users to store past messages and revisit them for reprocessing.

In this study, we adopted the five capabilities of communication media identified by Dennis *et al.* (2008) as the social media capabilities, since these capabilities (TV, parallelism, SS, rehearsability, and reprocessability) can support all the necessary functions on SMN platforms: digital profile, search and privacy, relational ties, and network transparency, as identified by Kane *et al.* (2014). For example, OpenOffice.org is the community of an open-source office software suite, and salesforce.com is a community reinventing CRM in the cloud. They both provide the capabilities of immediacy (TV), chatting (parallelism), programming (SS), editing (rehearsability), and versioning (reprocessability) to users and enable them to co-create an office tool similar

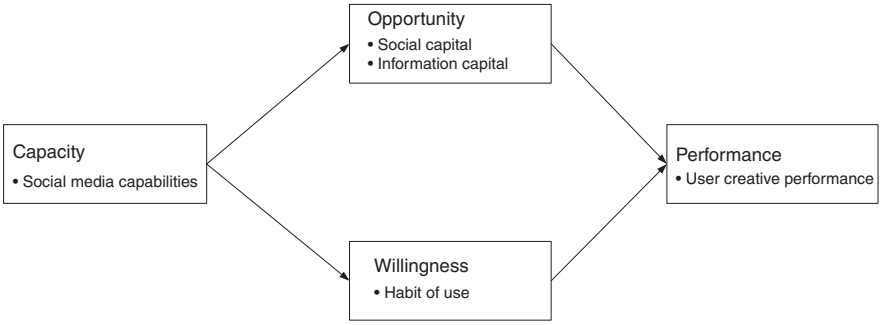


Figure 1.
An interactive framework for social learning performance

to Microsoft Office. As good communication media can process information from different sources of reference and support immediate communication (Dennis and Kinney, 1998), this study argues that social media capabilities form a collaborative and sharable capacity and enable users to perform message communication and information exchange over the SMN platforms.

3.2 Social capital theory

Nahapiet and Ghoshal (1998) proposed social capital with three dimensions: structural, cognitive, and relational. Structural capital involves social and network ties that indicate who can be reached and how describing the pattern of personal connections. Cognitive capital is viewed as the resources offering shared representations, interpretations, and systems of meaning among parties. Relational capital refers to actors' bond which helps to develop mutual trust through social interactions. Social capital has been applied to explain various pro-social behaviors, such as collective action, community involvement, and information technology service delivery (Chow and Chan, 2008; Sun *et al.*, 2012; Trier and Molka-Danielsen, 2013). The formation of social capital may be attributed to personal interactions in a social network (Okoli and Oh, 2007) through which members of the network accumulate actual or potential resources (Nahapiet and Ghoshal, 1998).

SMNs provide the technology and platform for users to interact by using online or offline media tools. Users can adapt to a medium more easily if it meets their needs (Dennis *et al.*, 2008). Previous studies have shown that the use of online media is a purpose-based choice that satisfies psychological needs (e.g. social ties, shared goals, and social trust) (Ko *et al.*, 2005; Kim *et al.*, 2011). Furthermore, social media supports users in socialization and interaction (Rideout *et al.*, 2005) which are the core activities of building social capital (Nahapiet and Ghoshal, 1998; Chewar *et al.*, 2005). For example, Facebook users with common interests can join virtual groups to make friends, learn about each other's' hobbies, tastes, opinions, etc. (Ellison *et al.*, 2007; Shi and Whinston, 2013). Thus, active communications enable users to build more social ties, earn more relational trust, and reach more mutual understanding among the community members (Chai *et al.*, 2012); these benefits correspond respectively to structural capital, relational capital, and cognitive capital in the social capital theory (Karahanna and Preston, 2013; Nahapiet and Ghoshal, 1998). Accordingly, SMN platforms (e.g. Facebook, Twitter) can facilitate personal interactions among participants and enable users to accumulate social capital through presenting themselves, articulating their social networks, and establishing or maintaining connections with others (Ellison *et al.*, 2007). Since social media capabilities can improve social capital, we hypothesize:

H1. Social media capabilities positively influence social capital.

3.3 Information exchange theory

Information exchange theory (Silver *et al.*, 1988; Troyer *et al.*, 2007) explains group decision making as a process of information trading among individuals that are driven by both task and social considerations. Information exchange refers to the amount and type of information (e.g. ideas, data/facts, opinions, interrogatives, positive and negative evaluations.) that members send to other members (Silver *et al.*, 1994; Goo *et al.*, 2009), as well as a process of information transmission and processing through which the members can accumulate pieces of information retrieved from the networks into their individual information capital (Kaplan and Norton, 2004).

Social media is an internet-based application allowing users to generate content and exchange information (Kaplan and Haenlein, 2010). Information exchange is vital to SMN users for personal growth (e.g. self-efficacy) and resource development (e.g. information capital). Researchers have suggested that information exchange can be measured by information quantity (e.g. total number of messages initiated and replied by an individual) and information quality (e.g. reliability, accuracy, timeliness, and relevance) (Lu and Yang, 2011). Malhotra *et al.* (2007) define these two characteristics as the breadth and quality of information. In this study, we adapt the bread and quality to measuring information capital as the total output of information exchange. Breadth of information refers to the richness and diversity of information content offered by SMN users. Quality of information refers to the timeliness, accuracy, relevance, and value of information content between SMN users.

Communication and information exchange (Hersberger *et al.*, 2007) are critical activities in information transmission and processing which transform personal ideas and information into a shared vision (Te'eni, 2001; Dennis *et al.*, 2008). SMNs provide users with capabilities to exchange information, knowledge and experiences through synchronized or non-synchronized interaction, i.e., using online real-time or batch modes of communication; whereas knowledge can be re-integrated, derived and created at any time and any place through incessant circulation and accumulation (Shang *et al.*, 2011). Through these communication modes of SMNs, the users can exchange symbols (texts, videos, images, files, emoticons, etc.) with each other to perform social interaction and message sharing; such activities result in accumulation of information capital (Kaplan and Norton, 2004). The importance of such interactive communication and information acquisition for sustaining social networks cannot be overemphasized (Teo *et al.*, 2003). In a social network, users can create new knowledge (i.e. a creative performance) based on the existing knowledge and continuously circulate and accumulate knowledge anytime, anywhere, and between anyone (Shang *et al.*, 2011). Participants who exchange little information can access only little content and receive little benefits from communication process. In addition, media capabilities determine the richness and quantity of message processing which facilitate the exchange of information between and within the organizations (Daft and Lengel, 1986). Participants who perform active communications are more likely to accumulate larger amount and higher quality of information capital, according to the information exchange theory (Silver *et al.*, 1988; Troyer *et al.*, 2007). Therefore, the information exchange (transmission and processing) can be further streamlined by media capabilities which provide physical, visual, and verbal SS suitable for message transmission (Dennis *et al.*, 2008) and, in turn, enhance the breadth and quality of information capital. *H2* is proposed as follows:

H2. Social media capabilities positively influence information capital.

3.4 Habit of use

Habit is a mental concept defined as learned responses to some kinds of stimuli (Verplanken *et al.*, 1998) and a form of routinized behavior (Vance *et al.*, 2012). It is viewed as a special kind of mind-set to promote the perceptual readiness for habit-related cues and adopt more efficient courses of action (Limayem *et al.*, 2007). James (1890) proposed that habit is a behavioral tendency to repeat responses in a stable supporting context and emphasized the importance of habits in managing people's daily lives. A stable context may facilitate habit formation by requiring only a minimum of individual's attention in reacting adequately to certain situations. Thus,

habit development requires a certain amount of repetition or practice (Orbell *et al.*, 2001). Although there are many studies linking past behavior to habit (e.g. decision making, learning, information technology usage), it has been evidenced that habits are automatic behavioral responses triggered by a situational stimulus (Chiu *et al.*, 2012). Scholars have further found that behavior's importance (e.g. personal relevance that is closely related to involvement, interest, salience, and goal-directed arousal capacity) can increase the likelihood that an individual's habit will develop (Lankton *et al.*, 2010). Triandis (1980, p. 204) defined habit as "situation-behavior sequences that are or have become automatic." On the other hand, an SMN platform provides users with the communication capability for facilitating participation in order to shape the habit of social learning. Currently, most users stick to new types of platforms such as Snapchat, Tumblr, and Foursquare. These platforms enable users routinely to send pictures with more privacy, write private microblog, and check-in at popular restaurants or places. It became a habit for young generation to use SMN platforms when they want to share their thoughts. That is, the more individuals are using social media to interact frequently, the more they are to develop a habit to link together and act collectively (Marwell and Oliver, 1988; Wasko and Faraj, 2005). As users gain learning experience, there is a shift from consciously driven behavior toward habitual behavior that users are not willing to change (Limayem and Cheung, 2008). This is the case with the well-known multimedia bulletin board "Wall" on Facebook where users can dynamically post their contents and learn from others. Thus, users will establish a routine and form habits of using the service because of their dependence on social media. In this vein, we infer that habit of use can be derived from a friendly social media environment with transmission and processing capabilities. This leads to our third hypothesis:

H3. Social media capabilities positively influence habit of use.

3.5 User creative performance

Creativity refers to the ability to discern new relationships, examine subjects from new perspectives, and form new concepts from existing notions (Couger, 1995). It is demonstrated by the process of developing and presenting an original concept or idea (Levesque, 2001; Oldham and Cummings, 1996). It is very different from innovation which has to do with the production or implementation of useful ideas or just a formation of novel ideas (Scott and Bruce, 1994). Perry-Smith and Shalley (2003) have argued that creativity contributes not only as a value-form but also includes the unparalleled thinking and problem solving of individual capability. In this study, we define user creative performance as the outcome achievement of creativity exhibited as a behavior during the use of an SMN platform. The higher extent of SMN use indicates the higher the creative performance.

As aforementioned, there are exogenous contextual opportunities (social capital and information capital) and endogenous individual willingness (habit of use) in the social learning environment. Studies have shown that knowledge accumulated from social network activities can stimulate group creativity (Fischer *et al.*, 2004; Florida, 2002), while friendly environment and culture supporting freedom of expression and sharing of opinion are helpful to the development and robustness of creativity (Eesley and Longenecker, 2006; Levesque, 2001). A society with creative ethos can drive the production of innovative ideas in a group through social network (Florida, 2002). Furthermore, user creativity can be enhanced under the social context and technical support (Fischer *et al.*, 2005). Historical evidences reveal that a significant correlation exists between group diversity and creative performance (Andrews and Aichholzer, 1979;

Visart, 1979) and that a positive correlation exists between group communication and generation of individual innovative ideas (Monge *et al.*, 1992). Accordingly, this study argues that the social capital accumulated by social interactions over multiple groups on SMN platforms may contribute to engendering individual user creative performance. Thus, we propose the fourth hypothesis as follows:

H4. Social capital positively influences user creative performance.

The other opportunity afforded by social learning is information capital. While SMNs facilitate information exchange and create information capital, the key to creativity and innovation lies in individual professional knowledge (Amabile, 1988). Nurturing creativity is an important activity in the course of information exchange process (Leenders *et al.*, 2003; Moenaert *et al.*, 2000). The creation of new knowledge must be based on existing knowledge and through mutual communication and information exchange among individuals from different fields (Nonaka and Toyama, 2003). Previous studies have shown that knowledge integration capability is a critical means for achieving creative performance (Bengtsson *et al.*, 2013) and that accumulation and exchange of collective knowledge realize a great deal of creativity (Florida, 2002). Different social network users have different professional knowledge and skills that stimulate creative thinking and shape the culture for social creativity (Fischer *et al.*, 2004, 2005; Florida, 2002). These users form a human capital which is a resource to enhance professional knowledge, develop personal skills, and improve creative performance (Woodman *et al.*, 1993). The information exchange between these users could accumulate information capital and induce creative thinking. Particularly, the openness of information capital enhances creative performance (Amabile, 1988; Woodman *et al.*, 1993) and generates new knowledge and creativity (Moenaert *et al.*, 2000; Leenders *et al.*, 2003). Hence, we argue that information capital may contribute to the degree of user creative performance and propose the fifth hypothesis as follows:

H5. Information capital positively influences user creative performance.

The willingness of social learning is the habit of use. Under a stable context of social interaction and information exchange, the routine use of SMNs has become a new kind of habit for individuals to get novel ideas. User creativity can be viewed as the creative adaption of habitual practices to specific contexts of action and it need to incorporate novel possibilities in practical action (Dalton, 2004). Moreover, human capital needs to embrace frequently the acquired knowledge, skills, and capabilities that enable individuals to act in a new way (Nahapiet and Ghoshal, 1998). For example, a user's routinely (or habitually) keeping updated with the latest trends in new things could facilitate shopping for ideas (Arnold and Reynolds, 2003) and increase his/her creative performance. Accordingly, this study argues that the habit of use may contribute to user creative performance. *H6* is proposed as follows:

H6. Habit of use positively influences user creative performance.

4. Research methodology

4.1 Research model

Based on the aforementioned discussion, an overview of the research model is shown in Figure 2. There is one consequence of social learning on SMNs: user creative performance. We argue that the two kinds of opportunities of social learning may affect user creative performance. First, the opportunity of social capital is proposed as a formative

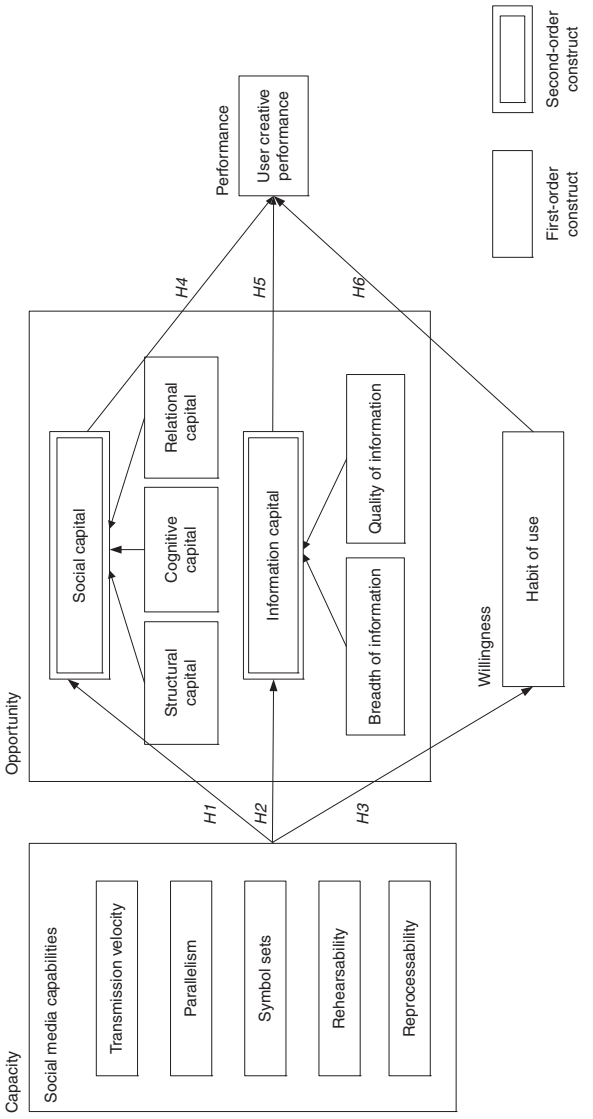


Figure 2.
Research model

second-order construct driven by structural capital, cognitive capital, and relational capital. Meanwhile, the other opportunity of information capital is postulated as another formative second-order construct as well driven by the breadth and quality of information. Second, we postulate that the individual willingness (habit of use) as a first-order construct that affects user creative performance. Finally, we propose that social media capabilities are critical factors in fostering social capital, information capital, and habit of use.

4.2 Measurement development

Many measurement items were adapted from the literature, except those measuring the constructs of social media capabilities and user creative performance. The questionnaire (included in the Table AI) was divided into six sections each related to social capital, information capital, media capabilities, user creative performance, habit of use, and demographic information. First, items measuring social media capabilities were designed from the operational definition proposed by Dennis *et al.* (2008). Second, items for social capital which consist of structural capital, cognitive capital, and relational capital were modified from Chiu *et al.* (2006) and Chow and Chan (2008). Third, items for information capital which consist of information breadth and quality were designed by referring to Malhotra *et al.* (2007). Fourth, items measuring user creative performance were developed from the conceptual definition provided by Scott and Bruce (1994) and Arnold and Reynolds (2003). Finally, items measuring habit of use were adapted from Limayem *et al.* (2007) and Chiu *et al.* (2012). For all measures, a seven-point Likert scale was used with anchors ranging from 1 (strongly disagree) to 7 (strongly agree).

For face validity, a small-scale pretest of the questionnaire was conducted with five professors and two experts in electronic commerce field and three PhD students having Facebook usage experience to evaluate the questionnaire's correctness, ease of understanding, and contextual relevance. Next, a pilot test with data collected from 52 Facebook users was conducted to confirm the measurement properties of the scale items. Facebook was chosen because it is the most sophisticated social media platform that provides a home for users to interact and communicate based on different needs, e.g., social interaction, information sharing, etc. (Ellison *et al.*, 2007; Park *et al.*, 2009). According to Socialbakers (2014), registered Facebook users exceed one billion worldwide with over ten million of them being in Taiwan. In other words, Facebook is the most popular social network website in the world (Compete, 2014).

We assessed reliability and validities of the constructs with the pilot sample of 52 users using Cronbach's α and principal-axis exploratory factor analysis. All the items measuring each construct (factor) had factor loading values higher than the threshold value of 0.5 as well as any other construct's item-loading values across both the rows and the columns on the factor loading table; both findings supported the construct validity of the questionnaire. Moreover, all the constructs had Cronbach's α values greater than the threshold of 0.7 and their AVE values all exceeded the benchmark of 0.5, both supported the convergent validity of the questionnaire. Specifically, the assessment results of the newly developed scale items for social media capabilities and user creative performance are shown in Table AII.

4.3 Data collection

Before the data collection process was launched, the entire survey questionnaire was translated into Chinese version following the back-translation and bilingual test of instrument translation process described in Maneesriwongul and Dixon (2004). Furthermore, the senior author served as the bilingual judge to ensure there was

not semantic loss in the process; while the other two authors served as the translators. The research data were then collected for two months from the Facebook users in Taiwan through a web survey on a number of bulletin board systems, chat rooms, and virtual communities. In order to attract Facebook users, a banner with a hyperlink to our web survey was placed on these different platforms inviting individuals with Facebook accounts to participate in our survey. The respondents were instructed to answer all the questions based on their Facebook usage experience. In total, 30 monetary prizes (US$ 10 each) were used as the incentive for participation.

4.4 Subjects

A total of 533 valid responses were collected for the data analysis. More than half of the users were male (59.1 percent) and between 20 and 29 years old (75.05 percent). Most of them had university degree (66.23 percent). The respondents mainly had Facebook usage experience between two and three years (40.15 percent), and most of them had over two hours per day (81.8 percent). Table I lists demographic information of the respondents.

5. Analyses and results

This study follows the two-step approach recommended by Anderson and Gerbing (1988) and Bagozzi and Yi (2012) to perform data analysis. The first step involved analyzing the measurement model, while the structural model delineating relationships among latent constructs was tested during the second step. The goal of using two-step approach was to establish the reliability and validity of the measures before assessing the model's structural relationships. Using partial least squares (PLS) path modeling with SmartPLS 2.0 software also allows us to estimate a model with hierarchical (mixed-order) constructs (Wetzels *et al.*, 2009) and a large or small sample size (Rönkkö and Evermann, 2013). As social capital and information capital in the model are postulated as two formative second-order constructs, we used PLS because it allows

Measure	Items	Frequency	Percent
Age	< 20	31	5.82
	20-29	400	75.05
	30-39	93	17.45
	> 39	9	1.68
Facebook experience (in years)	< 1	43	8.07
	1-2	77	14.45
	2-3	214	40.15
	3-5	188	35.27
	> 5	11	2.06
Gender	Male	315	59.10
	Female	218	40.90
Education	High school	22	4.13
	University	353	66.23
	Graduate school	158	29.64
Hours of Facebook use (per day)	< 1	21	3.94
	1-2	76	14.26
	2-5	198	37.15
	5-8	187	35.08
	> 8	51	9.57

Note: $n = 533$

Table I. Demographic information of respondents

latent constructs to be modeled as either formative or reflective indicators while keeping minimal restrictions on the measurement scales and residual distribution (Chin and Newsted, 1999). Moreover, a variance-based SEM method (e.g. PLS) is considered more appropriate than a covariance-based SEM method (e.g. LISREL or EQS) if the research objective is prediction and theory development (Hair *et al.*, 2011). As the aim of this study is to predict the influence of social media capabilities on user creative performance through social capital, information capital, and habit of use, the use of PLS approach is more appropriate than LISREL.

5.1 Measurement model

The rationale for operationalizing social capital as a formative second-order construct was threefold, based on the criteria recommended by Petter *et al.* (2007). First, according to the conceptual definitions of social capital, the first-order constructs of structural capital, cognitive capital, and relational capital should be regarded as resource forming dimensions of social capital (Chiu *et al.*, 2006; Chow and Chan, 2008; Nahapiet and Ghoshal, 1998). Second, all three dimensions as the first-order constructs were clearly unique, distinguishable, and not interchangeable. Third, all first-order constructs were theoretically independent and not highly correlated. Likewise from this rationale, information capital can be treated as a second-order construct consisting of two first-order constructs: breadth and quality of information. However, when we ran the full model, we did not include the first-order constructs of social capital and information capital. Instead, the second-order constructs (i.e. social capital and information capital) were approximated by using the approach of repeated indicators (or repeated manifest variables) calculated from the observations for the variables of the first-order constructs (Chin *et al.*, 2003). For example, of information capital, it uses all the six indicators of the breadth and quality of information as the indictors of its second-order construct as shown in Figure 3.

The adequacy of the measurement model was assessed in terms of reliability, convergent validity, and discriminant validity. We used composite reliability values to evaluate reliability. Table II indicates the values of composite reliability that were all above 0.7, thus, reaching the acceptable level. Fornell and Larcker (1981) have suggested that convergent validity can be verified by two criteria: all indicator loadings need to be significant and exceed 0.7; and average variance extracted (AVE) of each construct needs to exceed the variance owing to measurement error for the construct (i.e. AVE needs to exceed 0.5). As shown in Table II, AVE values ranged from 0.64 to 0.82. Table III shows the highlighted loadings of principal components are all higher than 0.7. Thus, the results satisfied both criteria for convergent validity.

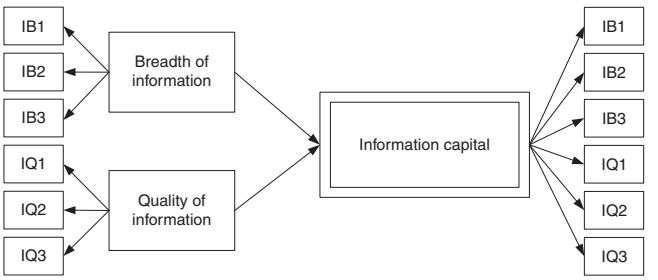


Figure 3.
Formative second-order construct: information capital

Construct	Items	Mean (Std.)	AVE	Cronbach's α	Composite reliability	VIF
Transmission velocity (TV)	3	5.65 (0.81)	0.82	0.89	0.93	2.36
Parallelism (PA)	3	5.64 (0.79)	0.81	0.88	0.93	2.55
Symbol sets (SS)	3	5.35 (0.79)	0.76	0.84	0.90	2.43
Rehearsability (RH)	3	5.27 (0.88)	0.79	0.86	0.92	2.43
Reprocessability (RP)	3	5.35 (0.93)	0.77	0.85	0.91	2.07
Structural capital (SC)	3	5.19 (0.80)	0.64	0.72	0.84	2.13
Cognitive capital (CC)	3	5.38 (0.76)	0.70	0.78	0.87	2.02
Relational capital (RC)	3	4.84 (0.87)	0.75	0.83	0.90	1.77
Breadth of information (IB)	3	5.16 (0.76)	0.73	0.82	0.89	2.20
Quality of information (IQ)	3	5.09 (0.83)	0.77	0.85	0.91	2.36
Habit of use (HA)	5	5.37 (1.04)	0.74	0.91	0.93	1.98
User creative performance (UCP)	4	5.16 (0.93)	0.74	0.89	0.92	DV

Notes: $n = 533$. AVE, average variance extracted; VIF, variance inflation factor; DV, dependent variable

Table II. Descriptive statistics of the constructs

To examine discriminant validity, the following four tests were used. First, an examination of cross-factor loadings (see Table III) indicated that the loading of each measurement item on its assigned latent variable was larger than its loading on any other construct (Chin, 1998). Second, the correlations among all constructs (shown in Table IV) are all well below the 0.85 threshold (Kline, 1998), suggesting that all constructs are distinct from each other. Third, the square root of the AVE from each construct (see Table IV) was considerably larger than the correlation shared between the construct and other constructs in the model (Fornell and Larcker, 1981). Fourth, the variance inflation factor values (shown in Table II) for all independent variables are less than the threshold value of 5 as suggested by Hair *et al.* (2011), indicating insignificant multicolinearity. Therefore, all four conditions for discriminant validity were met.

5.2 Structural model

In PLS analysis, examining the structural paths and the R^2 values of endogenous variables allows us to assess the explanatory power of the structural model. Paths exhibiting a p-value less than 0.05 are considered as significant. Bootstrapping of the 533 cases was done with 600 samples for significance testing. Figure 4 shows the results of structural path analysis. The path coefficient between social capital and user creative performance is 0.129 ($p < 0.01$), and the path coefficient between information capital and user creative performance is 0.315 ($p < 0.001$). As for habit of use and user creative performance, their path coefficient is 0.394 ($p < 0.001$).

For PLS path modeling, a global goodness-of-fit (GoF) measure was defined by Tenenhaus *et al.* (2005) as the geometric mean of the average communality (equals AVE) and average R^2 (for endogenous constructs). In our study, AVE values ranged from 0.64 to 0.82, and averaged to 0.752, which exceeds a cut-off value of 0.5 for communality, as suggested by Fornell and Larcker (1981). Moreover, in line with the effect sizes for R^2 (small: 0.02; medium: 0.13; large: 0.26), the GoF values are $\text{GoF}_{\text{small}} = 0.1$, $\text{GoF}_{\text{medium}} = 0.25$, and $\text{GoF}_{\text{large}} = 0.36$. R^2 of endogenous constructs are: social capital (45.2 percent), information capital (50.6 percent), habit of use (30.4 percent), and user creative performance (53.5 percent). The average R^2 equals 0.449. Therefore, the GoF can be calculated to 0.581, which exceeds the cut-off value of 0.36 for large effect sizes of R^2, and the fit of the overall structural model is acceptable.

	IB	UCP	HA	PA	RH	RP	SS	TV	IQ	CC	SC	RC
IB1	*0.85*	0.50	0.40	0.48	0.48	0.41	0.53	0.47	0.51	0.45	0.48	0.41
IB2	*0.88*	0.49	0.41	0.48	0.51	0.41	0.51	0.45	0.52	0.45	0.48	0.43
IB3	*0.84*	0.44	0.36	0.41	0.49	0.42	0.46	0.41	0.55	0.41	0.50	0.46
UCP1	0.51	*0.85*	0.57	0.51	0.50	0.48	0.49	0.47	0.55	0.43	0.51	0.38
UCP2	0.42	*0.86*	0.55	0.41	0.41	0.36	0.41	0.34	0.50	0.37	0.46	0.37
UCP3	0.47	*0.88*	0.56	0.40	0.45	0.38	0.45	0.33	0.49	0.34	0.45	0.35
UCP4	0.49	*0.85*	0.58	0.38	0.50	0.41	0.44	0.39	0.53	0.36	0.49	0.39
HA1	0.38	0.51	*0.85*	0.41	0.41	0.37	0.41	0.42	0.57	0.36	0.47	0.36
HA2	0.37	0.49	*0.86*	0.45	0.37	0.35	0.38	0.44	0.50	0.37	0.53	0.30
HA3	0.40	0.55	*0.89*	0.49	0.42	0.38	0.45	0.49	0.54	0.40	0.57	0.31
HA4	0.42	0.52	*0.88*	0.36	0.44	0.36	0.35	0.34	0.56	0.32	0.53	0.39
HA5	0.37	0.55	*0.82*	0.33	0.39	0.31	0.33	0.31	0.49	0.28	0.49	0.30
PA1	0.51	0.45	0.44	*0.89*	0.54	0.50	0.52	0.53	0.47	0.46	0.43	0.34
PA2	0.46	0.44	0.42	*0.91*	0.55	0.52	0.50	0.59	0.43	0.45	0.47	0.34
PA3	0.46	0.44	0.43	*0.91*	0.52	0.55	0.51	0.55	0.47	0.49	0.44	0.34
RH1	0.46	0.42	0.38	0.46	*0.86*	0.51	0.49	0.43	0.47	0.40	0.40	0.35
RH2	0.52	0.51	0.43	0.51	*0.92*	0.57	0.56	0.48	0.50	0.41	0.47	0.41
RH3	0.54	0.50	0.44	0.51	*0.88*	0.58	0.54	0.57	0.52	0.48	0.47	0.42
RP1	0.46	0.43	0.37	0.57	0.59	*0.91*	0.56	0.53	0.42	0.45	0.36	0.37
RP2	0.45	0.44	0.33	0.49	0.62	*0.91*	0.50	0.46	0.40	0.43	0.33	0.35
RP3	0.36	0.37	0.39	0.46	0.52	*0.81*	0.40	0.45	0.36	0.42	0.40	0.33
SS1	0.49	0.45	0.37	0.53	0.55	0.47	*0.86*	0.48	0.42	0.35	0.40	0.33
SS2	0.51	0.45	0.38	0.60	0.55	0.45	*0.89*	0.56	0.43	0.36	0.41	0.32
SS3	0.52	0.46	0.41	0.64	0.56	0.53	*0.86*	0.61	0.45	0.44	0.44	0.31
TV1	0.45	0.40	0.43	0.57	0.50	0.47	0.55	*0.90*	0.48	0.46	0.46	0.34
TV2	0.46	0.39	0.41	0.63	0.51	0.48	0.58	*0.93*	0.48	0.49	0.46	0.33
TV3	0.48	0.42	0.42	0.68	0.51	0.53	0.60	*0.89*	0.46	0.53	0.47	0.34
IQ1	0.55	0.53	0.56	0.39	0.50	0.38	0.43	0.41	*0.90*	0.43	0.50	0.45
IQ2	0.50	0.52	0.54	0.53	0.46	0.42	0.47	0.56	*0.84*	0.51	0.52	0.42
IQ3	0.56	0.53	0.53	0.41	0.51	0.38	0.42	0.41	*0.88*	0.43	0.48	0.44
CC1	0.45	0.37	0.29	0.42	0.41	0.41	0.37	0.46	0.41	*0.87*	0.45	0.49
CC2	0.43	0.35	0.34	0.45	0.42	0.45	0.39	0.49	0.44	*0.88*	0.44	0.50
CC3	0.40	0.38	0.38	0.42	0.39	0.37	0.36	0.42	0.44	*0.76*	0.43	0.46
SC1	0.48	0.46	0.47	0.50	0.46	0.37	0.46	0.50	0.45	0.53	*0.83*	0.41
SC2	0.47	0.49	0.55	0.26	0.38	0.25	0.33	0.26	0.49	0.28	*0.77*	0.46
SC3	0.41	0.38	0.42	0.42	0.37	0.36	0.36	0.44	0.43	0.43	*0.79*	0.34
RC1	0.41	0.35	0.33	0.28	0.35	0.31	0.27	0.29	0.43	0.47	0.41	*0.86*
RC2	0.47	0.41	0.33	0.39	0.42	0.39	0.35	0.36	0.47	0.53	0.45	*0.85*
RC3	0.44	0.36	0.35	0.31	0.39	0.34	0.33	0.32	0.40	0.50	0.46	*0.89*

Notes: $n = 533$. TV, transmission velocity; PA, parallelism; SS, symbol sets; RH, rehearsability; RP, reprocessability; SC, structural capital; CC, cognitive capital; RC, relational capital; IB, breadth of information; IQ, quality of information; HA, habit of use; UCP, user creative performance. Italic numbers indicate item loadings on the assigned constructs

Table III.
Confirmatory factor analysis

6. Discussion and implications

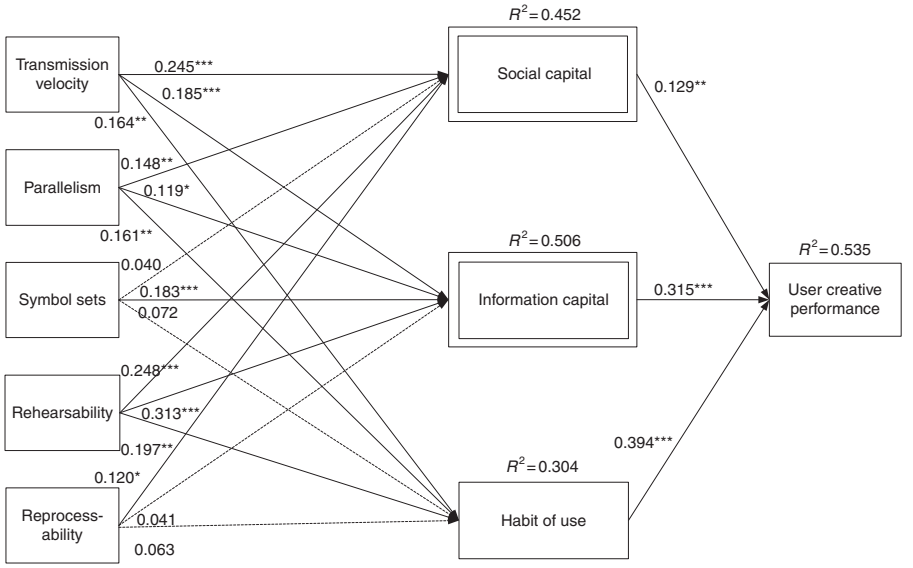
6.1 Summary of the results

The results in Figure 4 indicate that four out of five social media capabilities (i.e. rehearsability, TV, parallelism, and reprocessability) are significantly and positively related with social capital (as a second-order construct) and partially supporting *H1*. Rehearsability ($\beta = 0.248$, $p < 0.001$) enables synchronized communication and interaction on SMNs since this capability can save complete personal records of the

	IB	UCP	HA	PA	RH	RP	SS	TV	IQ	CC	SC	RC
IB	*0.86*											
UCP	0.55	*0.86*										
HA	0.45	0.66	*0.86*									
PA	0.53	0.49	0.48	*0.90*								
RH	0.58	0.54	0.47	0.60	*0.89*							
RP	0.48	0.47	0.41	0.58	0.66	*0.88*						
SS	0.58	0.52	0.45	0.68	0.64	0.56	*0.87*					
TV	0.51	0.44	0.46	0.69	0.56	0.55	0.64	*0.91*				
IQ	0.62	0.60	0.62	0.51	0.56	0.45	0.50	0.52	*0.87*			
CC	0.51	0.44	0.40	0.52	0.49	0.49	0.44	0.55	0.52	*0.84*		
SC	0.57	0.56	0.60	0.50	0.50	0.41	0.48	0.51	0.57	0.52	*0.80*	
RC	0.51	0.43	0.39	0.38	0.45	0.40	0.37	0.37	0.50	0.58	0.51	*0.87*

Notes: $n = 533$. TV, transmission velocity; PA, parallelism; SS, symbol sets; RH, rehearsability; RP, reprocessability; SC, structural capital; CC, cognitive capital; RC, relational capital; IB, breadth of information; IQ, quality of information; HA, habit of use; UCP, user creative performance. The italic diagonal values are square roots of AVE. All correlations are significant at $p < 0.001$

Table IV.
Correlation among constructs and the square root of the AVE



Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Figure 4.
SEM analysis of the research model

communication and exchange processes (Tokunaga, 2011). SMNs generally have archival recordability and deleteability (Walther *et al.*, 2008) to enhance communication among users, thus increasing their social ties ($\beta = 0.345$, $p < 0.001$), shared goals ($\beta = 0.410$, $p < 0.001$), and social trust ($\beta = 0.444$, $p < 0.001$). Taking the Draft function in Facebook as an example, messages on the Walls or the ones directly received from other users can be saved for future reviews. Therefore, users can learn about the past activities by reviewing messages (Nunamaker *et al.*, 1991). Next,

TV ($\beta = 0.245$, $p < 0.001$) allows large amount of messages to be exchanged among the users; thus it can increase the collaboration of and cohesion among groups, and then enhance the intensity of social networks among people as well as the shared values which arise from those networks. Meanwhile, parallelism ($\beta = 0.148$, $p < 0.01$) allows users to transmit and exchange multiple messages simultaneously (Dennis *et al.*, 2008), enhancing the efficiency of social interactions among SMN members. Lastly, reprocessability ($\beta = 0.120$, $p < 0.05$), such as the message editing function in Facebook, can help users to cognitively understand accurately new, numerous, and complex messages (Dennis *et al.*, 2008). In sum, proper use of social media capabilities can satisfy users' needs and help them develop social relationships, enhance social interactions, improve social cognition, and accumulate social capital (Kim *et al.*, 2011; Ko *et al.*, 2005; Rideout *et al.*, 2005).

As for the relationships between social media capabilities and information capital (as a second-order construct), the results reveal that rehearsability, TV, SS, and parallelism have significant and positive effects on information capital, partially supporting *H2*. Among the social media capabilities, rehearsability ($\beta = 0.313$, $p < 0.001$) has the most significant influence on information capital. Possible explanation might be that rehearsability enables message senders on an SMN platform such as Facebook to acknowledge, save, edit, and review messages any time before sending them out to the other users; thus, making it easier for the receivers to cognitively understand the messages (Cornelius and Boos, 2003; Dennis *et al.*, 2008; Kock, 1998). Next, the speed of message exchange offered by TV ($\beta = 0.185$, $p < 0.001$) increases the performance of user in information exchange and expedites the accumulation of information capital. Moreover, Dennis *et al.* (2008) indicate that proper use of SS ($\beta = 0.183$, $p < 0.001$), such as pictures or videos instead of texts, can increase the efficiency of message transmission and make the messages clearer for receivers. Finally, parallelism ($\beta = 0.119$, $p < 0.05$) indicates that multiple conversations and synchronized transmission proceed simultaneously. Although such a process may damage cohesion among users (Dennis *et al.*, 2008; Simpson, 2005), evidences show that parallel exchange and distribution of information are widely and efficiently used in many ways, such as discussing a project or planning for a trip in a private group on Facebook. Surprisingly, the results show that reprocessability ($\beta = 0.041$, $p > 0.05$) has an insignificant effect on information capital despite that reprocessing ability may delay message transmission and synchronized communication and hinder cohesion and collaboration of SMNs (Dennis *et al.*, 2008). Probable explanation for this finding is that message senders and receivers may spend considerable time to review numerous messages on such SMNs as Twitter and Facebook. As users tend to receive many messages, they might review not all in detail but only those that they are interested in or required to. Such kind of selective attention to messages appears to be unimportant to the accumulation of information capital. In general, there is no doubt that proper use of different media capabilities can enhance information capital among groups (Daft and Lengel, 1986; Dennis and Kinney, 1998).

Furthermore, three social media capabilities are significantly and positively related with habit of use: rehearsability, TV, and parallelism; this partially supports *H3*. First, rehearsability ($\beta = 0.197$, $p < 0.01$) has the most significant influence on habit of use. When SMN users rehearse and reorganize the content to improve the accuracy and relevance of content, they are likely to attract more people with similar interests and develop their habits of use. For example, in a community of practice with financial interest, high quality and quantity of financial information on SMNs could attract more

investors to routinely access and review the information to formulate their investment behaviors accordingly. Second, high TV ($\beta = 0.164$, $p < 0.01$) enhances habit of use. People today increasingly rely on large amount of information on SMNs for their daily life because social media is dynamic and efficient. Finally, parallelism ($\beta = 0.161$, $p < 0.01$) significantly influences habit of use. One possible explanation might be that individuals spontaneously use social media as an everyday vehicle for multi-tasking conversations and synchronized transmissions. For instance, many users have developed habits to simultaneously "check-in" on Facebook to share photos or the latest news right away in public places. Overall speaking, social media capabilities significantly affect habit of use. This is consistent with the finding of Limayem *et al.* (2007) that users frequently leverage a multifeatured IS (e.g. the WWW) for many different purposes leading to develop a strong habit of use.

The results further reveal that social capital ($\beta = 0.129$, $p < 0.01$) and information capital ($\beta = 0.315$, $p < 0.001$) have significant and positive effects on user creative performance; this supports *H4* and *H5*, respectively. In reality, SMNs can be considered as virtual groups where members interact with each other (Woodman *et al.*, 1993). Certain researchers have indicated that group diversity is related to user creative performance (Andrews and Aichholzer, 1979; Visart, 1979; Woodman *et al.*, 1993). Our results are consistent with the findings of Subramaniam and Youndt (2005) who have indicated that social capital and user creative performance have positive relationship. A plausible explanation is that Facebook users often provide new ideas or creative ways to help fellow users solve problems. Their social capital derived from Facebook enables them to realize these ideas and solutions. For example, a user may create a page promoting certain ideas which result in thousands of "likes." Such support from the community might encourage the user to continue posting creative ideas in the future, thus, enhancing his/her creative performance. This may explain why social capital significantly influences user creative performance. Finally, the finding that information capital has a positive effect on user creative performance is consistent with Amabile's (1988).

Finally, we found that habit of use exerts a significant effect ($\beta = 0.394$, $p < 0.001$) on user creative performance; this supports *H6*. In a study about library users prior to the internet era, Ford (1973) found that creative users made more use of a wider variety of channels to search for specific data themselves. In the context of SMN today, many people are used to obtaining knowledge or information from social media. This can stimulate their thinking and enable them to develop more creative ideas based on the existing knowledge. For example, many artists emerge on social media to share their works such as customized cards, t-shirts, paintings, or creative gifts. Hence, we conclude that habit of use can enhance user creative performance significantly.

6.2 Theoretical contributions

In terms of theoretical contributions, this study builds a theoretical model based on the theory of work performance to examine the effects of the five types of social media capabilities on user creative performance, through social capital, information capital, and individual habit of social learning on SMNs. The inclusion of the five capabilities also gives rise to a more elaborate model that better explains the antecedents of user creative performance in the SMN context. Besides, social capital theory enables us to explain how people in a social network interact and accumulate actual or potential resources from building more social ties, earning more relational trust, and reaching more mutual understanding among them (Wasko and Faraj, 2005; Sun *et al.*, 2012; Trier and Molka-Danielsen, 2013). From this perspective, we empirically confirm that

social media capabilities are instrumental in facilitating more social learning among people which leads to growing social capital, and in turn enhances creative performances and productivity on the SMN platforms. Meanwhile, information exchange theory allows us to explain the social learning process that are triggered by both task and social considerations, through information transmission and processing among SMN members, for the purpose of developing breadth and quality of content. From this viewpoint, social media capabilities are instrumental in providing social transparency (Stuart *et al.*, 2012), which is the ability to observe and monitor the interactions of others within and across applications on internet. It enables more availability of social messages surrounding information exchange in the SMN context, leading to increase in information capital. From the habit perspective, the social media capabilities are needed to shape users' habitual behaviors on SMNs, which can influence the effects of social media capabilities on user creative performance, for learning or absorbing a particular behavior from others, e.g., cooking, dressing up, repairing, etc. In addition, the high explained variances (R^2 values) in social capital (45.2 percent), information capital (50.6 percent), and habit of use (30.4 percent) imply that the five social media capabilities have different important effects on these three constructs. Thus, the study sheds light on the potential of the five social media capabilities as the enablers of social capital, information capital, and habit of use on SMNs.

Social capital ($\beta = 0.129$, $p < 0.01$), information capital ($\beta = 0.315$, $p < 0.001$), and habit of use ($\beta = 0.394$, $p < 0.001$) represent three different promoters of user creative performance. Studies have suggested that creativity in social psychology is built on individual network relationship, since it can be generated from mutual thinking and experience exchange (Simonton, 1984; Fischer *et al.*, 2004). Most studies related to SMNs have emphasized the importance of social interaction in building collaborative knowledge (Chow and Chan, 2008; Wasko and Faraj, 2005). We introduce social capital and information capital as the opportunities of social learning. In addition, we use structural capital, cognitive capital, and relational capital to form a second-order construct of social capital. Although all three capitals are significant formative indicators of social capital, their levels of importance are not the same. Relational capital ($\beta = 0.444$, $p < 0.001$) is the strongest source of social capital on SMNs, followed by cognitive capital ($\beta = 0.410$, $p < 0.001$) and structural capital ($\beta = 0.345$, $p < 0.001$). A possible explanation is that an individual mainly adopts an SMN in order to foster trusting relationships and engender relational capital with others (Wasko and Faraj, 2005). Furthermore, we use breadth ($\beta = 0.541$, $p < 0.001$) and quality ($\beta = 0.572$, $p < 0.001$) of information to form the second-order construct of information capital, and they have nearly equal importance to information capital on SMNs. A possible explanation is that social media capabilities can facilitate collaboration by enlarging the reach and richness of information exchange across a wide range of participants and activities. Our findings indicate that habit of use is more important to user creative performance than information capital and social capital. The users can realize the value of social media through appropriate use of the media and further form habits of social learning through interactions with others to promote their individual creative performance.

Past studies have viewed creative thinking as a process that could be pursued on an individual (Shalley, 1995) or organizational basis (Thatcher and Brown, 2010). However, few of them placed emphasis on the SMN context and its effect on enhancing user creative performance in virtual communities. Although the process of creative behavior is individualistic in nature, users tend to act in a group context while being affected by environmental factors (e.g. social media capabilities) that influence creative

performance. This study contributes to creativity literature by extending common research scope of employee-organization relationships into user-community relationships in the SMN context.

6.3 Managerial implications

There are three implications for management from this study. First, social media capabilities can help users develop social capital, information capital, and habit of use. They are important factors determining the design and effectiveness of an SMN platform. Companies providing SMNs could select any of the five types of social media capabilities based on a specific service type and develop a hybrid model of SMN that uses a mix of the capabilities. For example, considering an SMN such as Facebook or Twitter that provides the chat function to allow users to chat using texts and emoticons simultaneously, this function is supported by the capabilities of "parallelism" and "SS." According to this study, TV, parallelism, and rehearsability are the three most important factors of SMN service in order to improve its quality and the interaction among users. A healthy SMN platform must implement at least these three media capabilities: the functions of news feed (i.e. TV), chat (i.e. parallelism), edit (i.e. rehearsability), in order to sustain its service.

Second, user creative performance can be increased in various ways through social capital, information capital, and habit of use. The extant SMNs allow users to maintain their existing social relationships and establish new ones through social trust, common interests, and network ties. Besides, an SMN with a variety of content attracts different types of users to deliver and exchange information on its platform. Such an SMN entices users to access its content routinely and form the habits of use. The social interaction on the SMN increases information capital and social capital of SMN users and enables the platform providers to analyze these capitals and render precision marketing services. From this study, we suggest that a company should use SMNs (e.g. Facebook or Twitter) to enable employees to interact and exchange ideas and promote "coopetition" among employees across the company, resulting in increased user creative performance. If the organizational culture supports free expression of ideas and sharing of opinions, the development and robustness of group creativity can be enhanced (Levesque, 2001; Eesley and Longenecker, 2006), leading to higher competitive advantage for a company against its competitors.

Finally, habit of use can stimulate user creative performance more than information capital and social capital. Habit of use is the learned sequences of acts that have become automatic responses to specific cues (Limayem *et al.*, 2007; Vance *et al.*, 2012). While creativity can be developed and fostered through open interaction experiences (Hjalager, 2010), enhancing breadth and quality of user experience can increase creative performance. Therefore, companies should use features of SMNs to facilitate employees to accumulate daily life experience. Instead of prohibiting the use of SMNs in the workplace, companies should allow employees to use SMNs at work frequently in order to enhance their creative performance. In other words, the use of SMNs should not be limited by time and space, allowing users to exchange, share, and regenerate creative knowledge anytime and anywhere. Accordingly, an SMN service provider should design its services to entice users to form individual habits of social learning within various groups; this helps to enhance the users' creative performance.

6.4 Limitations and future research

Because of the sampled subjects and the single research method, there are some limitations in this study. First, the research results may lack generalizability that

should be taken into account when the results are interpreted. The current samples were from the Facebook users located in one country. We encourage researchers to test the proposed theoretical model further with additional subjects from around the world. This also allows us to explore the cultural differences among the subjects. Second, this study measured respondents' creative performance using text descriptions rather than graphic images because of the limited functions of the online questionnaire system. However, both words and pictures are important measures to capture the linguistic logic and image reasoning aspects of creativity (Torrance, 1966). Future researches could collect data with both types of measures via paper questionnaires to explore multiple aspects of creative performance. In addition to the subjective rating of user creative performance, an attempt to further measure creative performance objectively through pictures is recommended. Third, the results of this study confirm that social media capabilities enable social capital, information capital, and habit of use to promote user's creative performance; however, there should be other antecedents of creativity, such as rewards (Eisenberger and Rhoades, 2001) and perceived organizational support (Eisenberger *et al.*, 1990). Further effort is needed to improve understanding of the linkages between these alternative factors and creativity. Fourth, time is an important additional variable for creative performance. For example, there may be differences among the subjects before and after the survey. Nevertheless, we did not identify how long does it take for a user to enhance his/her creative performance. Improvements in an individual's creative performance before and after using social media could be investigated in the future. Fifth, 75.05 percent of respondents in our sample aged between 20 and 29 because the majority of active Facebook users are students. Hence, future research should use a greater variety of subjects, and consider aspects, such as age, gender, and different levels of computer literacy, to explore if these different groups significantly affect creative performance in SMNs. Finally, this study postulates the research model with directional causal relationships. In fact, the original job performance model proposed by Blumberg and Pringle (1982) consists of interactive correlations. The readers should keep this in mind when interpreting the results of our analyses. Future research may examine our research model in an interactive manner by extending the current directional relationships.

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Appendix

Table AI.
Questionnaire items

Social capital (adapted from Chiu et al., 2006; Chow and Chan, 2008)
Structural capital (SC)
- SC1. In general, I have a good relationship with many Facebook members
- SC2. In general, I am close to many Facebook members
- SC3. I frequently hold lengthy discussions with many Facebook members

Relational capital (RC)
- RC1. Members in Facebook are truthful in dealing with one another
- RC2. I know Facebook members will try to help me out if I get into difficulties
- RC3. I can trust Facebook members to lend me a hand if I need it

Cognitive capital (CC)
- CC1. Facebook members and I agree on what is important at something (e.g. work)
- CC2. Facebook members and I share the same ambitions and vision at something (e.g. work)
- CC3. Facebook members and I are enthusiastic about sharing the collective goals and missions

Information capital (adapted from Malhotra et al., 2007)
Breadth of information (IB)
- IB1. Extent to which I exchange information related to my favorite things and experiences with Facebook members
- IB2. Extent to which I exchange future plans such as study or working plans, with Facebook members
- IB3. Extent to which I exchange details of upcoming changes or plans for my life with Facebook members

Quality of information (IQ)
- IQ1. Compared with information exchanged with other community websites, I think the information exchanged with Facebook members is relevant to my needs
- IQ2. Compared with information exchanged with other community websites, I think the information exchanged with Facebook members is timely
- IQ3. Compared with information exchanged with other community websites, I think the information exchanged with Facebook members is complete

Social media synchronicity (adapted from Dennis et al., 2008)
Transmission velocity (TV)
- TV1. I can immediately respond to questions raised by other members on Facebook
- TV2. Other members can immediately respond to the knowledge I have shared on Facebook
- TV3. The message I have announced on Facebook can quickly be spread out

(*continued*)

Table AI.

Parallelism (PA)
- PA1. I can exchange information with many users simultaneously on Facebook
- PA2. I can discuss with many users simultaneously on Facebook
- PA3. I can receive many messages from different users simultaneously on Facebook

Symbol sets (SS)
- SS1. I can use various emoticons (e.g. ☺, 👍, ^_^) to share information on Facebook
- SS2. I can use many different languages (e.g. Orz, lol, XD) to share my information on Facebook
- SS3. I can use many different representations (e.g. graphics, music, videos) to help communicate and interact on Facebook

Rehearsability (RH)
- RH1. I can refine the information iteratively before I publish on Facebook
- RH2. I can continuously provide different versions of opinions for the same information or question on Facebook
- RH3. I can supplement the information that other members or I provided on Facebook

Reprocessability (RP)
- RP1. I can review the information I provided on Facebook
- RP2. I can reorganize (or rearrange) the information I provided on Facebook
- RP3. I can re-edit or delete the information I provided to other users on Facebook

Habit of use (HA) (adapted from Limayem et al., 2007; Chiu et al., 2012)
- HA1. When I need to use online social networking services, using Facebook is an obvious choice for me
- HA2. Using Facebook has become a routine for me
- HA3. Using Facebook is natural to me
- HA4. Using Facebook is typically "me"
- HA5. If I do not use Facebook, it makes me feel weird

User creative performance (UCP) (adapted from Scott and Bruce, 1994; Arnold and Reynolds, 2003)
- UCP1. I use Facebook to keep up with the trends more effectively
- UCP2. I use Facebook to generate more creative ideas
- UCP3. I use Facebook to experience more new things
- UCP4. Using Facebook helps me more effectively express different stances and opinions to others

Table AII.
Measurement properties of the new scale items in the pilot test

Construct	Cronbach's α	Item	Factor loading of EFA TV	PA	SS	RH	RP	UCP	Total variance explained (%)	AVE	VIF
Transmission velocity (TV)	0.89	TV1	*0.81*	0.23	0.24	0.14	0.09	0.12	16.65	0.64	1.91
		TV2	*0.83*	0.21	0.16	0.26	0.15	−0.03			
		TV3	*0.84*	0.18	0.09	0.11	0.18	0.15			
Parallelism (PA)	0.85	PA1	0.45	*0.69*	0.18	−0.01	0.23	0.02	32.51	0.59	1.96
		PA2	0.13	*0.86*	0.11	0.22	0.11	0.25			
		PA3	0.40	*0.68*	0.04	0.20	0.31	0.07			
Symbol sets (SS)	0.89	SS1	0.37	0.13	*0.80*	0.20	0.17	0.14	46.84	0.62	1.91
		SS2	0.11	0.23	*0.80*	0.25	0.17	0.23			
		SS3	0.12	−0.03	*0.79*	0.07	0.36	0.19			
Rehearsability (RH)	0.91	RH1	0.34	0.02	0.37	*0.69*	0.37	0.18	59.77	0.56	2.36
		RH2	0.22	0.30	0.18	*0.76*	0.21	0.30			
		RH3	0.23	0.23	0.24	*0.64*	0.23	0.46			
Reprocessability (RP)	0.87	RP1	0.13	0.22	0.22	0.28	*0.83*	0.01	71.85	0.59	2.22
		RP2	0.09	0.29	0.31	0.31	*0.72*	0.23			
		RP3	0.42	0.13	0.24	0.03	*0.68*	0.15			
User creative performance (UCP)	0.84	UCP1	0.27	0.21	0.17	0.19	0.10	*0.74*	82.53	0.61	DV
		UCP2	0.24	0.26	0.39	0.17	−0.11	*0.64*			
		UCP3	−0.13	0.08	0.26	0.16	−0.02	*0.83*			
		UCP4	0.05	−0.05	−0.04	0.08	0.34	*0.86*			

Notes: $n = 52$. EFA, exploratory factor analysis; AVE, average variance extracted; VIF, variance inflation factor; DV, dependent variable

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