Industrial Marketing Management 54 (2016) 4–14

Contents lists available at ScienceDirect

Industrial Marketing Management

How social media applications affect B2B communication and improve business performance in SMEs

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ARTICLE INFO

Article history:
Received 28 September 2015
Received in revised form 13 December 2015
Accepted 15 December 2015
Available online 4 January 2016

Keywords:
Social media apps
B2B collaboration
Communication
Small and medium enterprises
Media synchronicity theory

ABSTRACT

Social Media Apps (SMA) are widely used to facilitate individual communications. In company situations, they are utilized as a channel to communicate with their customers. However, studies examining how SMA have been utilized in the Business-to-Business (Social Media Benchmarking Report, 2014) context are lacking. Using a model based on Media Synchronicity Theory (MST), we present one of the first empirical studies investigating the relationship between the capabilities of SMA (transmission velocity, parallelism, symbol sets, rehearsability, and reprocessability) and B2B communication and business performance. Five case studies based on face-to-face interviews with the senior managers/owners of SME (Small and Medium Enterprises) were conducted. The data were analyzed and the findings confirmed the SMA media capabilities as explained by MST. The findings also revealed a missing SMA capability, that of information security and control, which has been added to the proposed model and which may be an important addition to MST. This study calls for more research to verify this finding.

1. Introduction

According to a recent report by McKinsey, the speed of adoption of social media apps (SMA) such as LINE, WeChat, Facebook and What's Up by companies is increasing rapidly over time (McKinsey&Company, 2014). SMA can be used to create a home page to make announcements, to share text, image and videos, to message and to set up groups for communications with customers and business partners. Companies, especially those in the industrial markets, can utilize SMA to achieve a variety of business purposes. Companies now use SMA to communicate with their customers and suppliers, to build relationships and trust, and to identify prospective trading partners (Shih, 2009), as well as to promote brands and to support the creation of brand communities (Kaplan, 2012; Leek & Christodoulides, 2011). For example, companies can create business accounts to promote their products and to share information with customers via their social media pages (Järvinen & Taiminen, 2016; example images can be seen in Appendix I). As reported, one third of B2B marketers are using SMA for generating product demand (B2B Marketing, 2014).

Previous literature mostly focuses on the adoption of such tools (e.g., Siamagka et al., 2015), somewhat surprisingly, there is a scarcity of academic reports indicating how companies use SMA for B2B communications. As pointed out by Jussila, Kärkkäinen, and Aramo-Immonen (2014), while the importance of SMA for B2B markets has been widely accepted, the impact of SMA may not yet be realized. For example, one study indicates that 92% of marketers agree with the importance of SMA to their business (Stelzner, 2014), while from another study, only 6% of surveyed buyers claim that SMA affect their B2B buying processes and 10% of them believe that SMA help to establish a company's credibility (Huff, Edmond, & Gillette, 2014). Moreover, within the B2B context, less attention has been paid to the use of SMA by SMEs than by big enterprises (Wamba & Carter, 2014). Given that SMEs represent a significant part of most countries' economies (LaPlaca, 2011), prior studies have investigated the adoption and use of SMA by B2B SMEs (Wamba & Carter, 2014), as well as their expected benefits and barriers (Michaelidou, Siamagka, & Christodoulides, 2011). However, little research has investigated B2B performance based on SMA use.

This paper provides initial findings into how SMA are used to improve SMEs' performance in B2B communication and their business outcomes. Drawing from Media Synchronicity Theory (MST) (Dennis, Fuller, & Valacich, 2008), this study investigates the relationship between the capabilities of SMA and SMEs' satisfaction with the B2B communication process and outcomes. MST explains that communication performance results from the fit of media capabilities with the needs of business communication and leads to enhanced business performance (Dennis et al., 2008). The capabilities of a communication medium refer to the objective physical characteristics of the medium, which are not subject to the influence of prior experiences and context of using the medium. These media capabilities include transmission velocity, parallelism, symbol sets, rehearsability, and reprocessability. We believe

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http://dx.doi.org/10.1016/j.indmarman.2015.12.004
0019-8501/

that companies are using SMA because potentially those apps' capabilities can contribute to the effectiveness of communication in industrial markets and subsequently enhance business performance.

Therefore, guided by MST, this study aims to describe processes by which SMA enhance SMEs' B2B performance. This study answers Swani, Brown, and Milne's (2014) call for research on the impact of SMA on firm performance in B2B contexts. By examining the impact of specific SMA capabilities on communication performance and business outcomes, this study also aims to underline the suitability of the SMA as a communication channel among B2B SMEs (Michaelidou et al., 2011). In addition, the literature has looked for explanations and suggestions on further motivating practitioners to use SMA because companies seem unclear on motivations to use SMA (B2B Marketing, 2014). Furthermore, the extant studies on SMA usage in SMEs primarily adopt descriptive surveys in an attempt to discover reasons for their use, benefits, and barriers (Jussila et al., 2014). Therefore there is a clear need to examine developments in this area from a more theoretical perspective to gain deeper insights into the rapidly developing field of SMA in the context of B2B SMEs (Stockdale, Ahmed, & Scheepers, 2012).

This paper is organized as follows: Section 2 introduces the theoretical lens of this study, discusses related studies and presents the development of a research model. Section 3 describes the research design and Section 4, the findings and discussion of the data. The final section concludes with implications of the study and the plans for further research.

2. Theoretical development

2.1. Media synchronicity theory (MST)

MST explains how media capabilities influence communication performance, which in turn affects business performance (Dennis et al., 2008). Such a process includes three fundamental factors – communication media capabilities, users' perceptions of communication media, and communication task – all of which interplay (Fox, Leicht, & Messner, 2009). MST holds that communication performance is determined by the match between media capabilities and the underlying communication process which is required for the completion of a particular task (Dennis et al., 2008). Dennis et al. (2008) define media capabilities as "the potential structures provided by a medium which influence the manner in which individuals can transmit and process information" (p.583).

MST identifies five media capabilities: transmission velocity, parallelism, symbol sets, rehearsability, and reprocessability (Dennis et al., 2008). Transmission velocity reflects the speed at which a medium can transfer a message from a sender to an intended receiver. Parallelism means the number of simultaneous communications that can occur through a medium. Symbol sets are the number of ways in which information can be encoded for communication. Rehearsability is the extent to which the medium enables the sender to rehearse or fine-tune a message during encoding before transferring it. In turn, reprocessability refers to the extent to which the medium enables a message to be re-examined or reprocessed during or after the communication.

In addition, MST proposes that communication for a task involves two primary processes: conveyance and convergence. Conveyance mainly describes the transmission of information, especially a large amount of raw information, from a sender to the receivers who need to interpret and understand the information. Convergence mostly focuses on processing the information being exchanged between the receivers to reach a mutual understanding of the meaning of the information between the sender and the receivers. MST argues that successful communication for completion of a task requires both conveyance and convergence (George, Carlson, & Valacich, 2013). It should be noted that conveyance and convergence require both the transmission and processing of information, but with different emphases. In addition, while conveyance requires the medium to be fast and robust in transmitting information, perhaps in various formats and in parallel, convergence typically needs the medium to enable back and forth information exchange.

MST has been used to investigate the impact of social media use on employees' job performance within organizations. For example, Cao, Vogel, Guo, Liu, and Gu (2012) found that social media can enhance trust among employees, which leads to better work performance. Charoensukmongkol (2014) confirms that social media use at work by employees is positively associated with job satisfaction and job performance. MST has also guided research conducted in the customer-to-customer (C2C) contexts, such as that of Kwahk, Ge, and Lee (2012) who suggest that the use of instant messenger influences buyers' purchase intention through increased trust in the vendor and customer satisfaction. However, investigation in the B2B context is lacking. This study attempts to extend the application of MST to inter-organizational communication between SMEs based on SMA.

MST can provide a good theoretical background for this study for three reasons. Firstly, MST proposes that the impact of media on business performance is mediated by communication performance. Rather than linking media directly to tasks and task performance, MST emphasizes the role of communication performance (Min & Li, 2012). Secondly, MST proposes a framework to understand the capabilities of a medium in an objective way (Dennis et al., 2008). Dennis et al. (2008) point out, many of the media characteristics identified by other media theories are "actually socially derived characteristics, whose salience is influenced by prior experience and context of use" (p. 576). Comparably, adopting the media capabilities identified by MST allows for the investigation of the true effect of the medium itself on communication performance. Thirdly, MST holds that a task comprises two fundamental processes. By looking at the process of communication, rather than at the task itself, MST deepens our understanding of the influence of media on communication performance (Hassell & Limayem, 2011). Moreover, by describing the two processes underlying every task – conveyance and convergence – MST shows a way to examine the impact of media on a variety of tasks in a consistent manner, which may provide insight into the effective adoption of media for conducting different tasks.

2.2. Communication performance and business performance

SMA provide an ideal combination of media capabilities for communication (Cao et al., 2012). Because of this, using SMA as communication channels can potentially enhance SMEs' business performance in a number of ways (e.g. Barashi, 2012; Wamba & Carter, 2014), which can be understood from three perspectives.

Firstly, the literature has focused on marketing as a primary objective of SMEs in using SMA. For example Kahar, Yamimi, Bunari and Habil (2012) point out, that the primary reason SMEs use SMA is to establish visibility among present and prospective customers, along with keeping in touch with them. Through SMA, SMEs can communicate their brand to reach wide audiences (Michaelidou et al., 2011), display the latest information for current customers, and gain new customers (Barashi, 2012). In addition, SMEs can also use SMA to communicate with suppliers and to identify prospective partners in the distribution channel (Shih, 2009).

Secondly, SMA are important in the innovation process in an organization (Nguyen, Yu, Melewar, & Chen, 2015; Wamba & Carter, 2014). SMA can support customer involvement so that organizations can gain clear insights into customer needs (Stockdale et al., 2012). Drawing on customer insights can aid organizations in identifying and addressing negative publicity and customer complaints and likewise to recognize, acquire and exploit new knowledge (Stockdale et al., 2012). SMA can

also be utilized by SMEs to identify new business opportunities and new product ideas, to develop their products, and to improve their services (Barashi, 2012; Jussila et al., 2014). SMA can also enable joint learning and prompt feedback between companies and other parties (Michaelidou et al., 2011). Through SMA, organizations can gain clear insights into industry trends and identify market gaps (e.g., analyze Facebook content and discussions) (Stockdale et al., 2012), as well as a means to adapt to new market conditions (Pardo, Ivens, & KevinWilsonc, 2013).

Thirdly, SMA are important in facilitating SMEs to collaborate with each other. SMEs have limited resources and are highly dependent on the resources and expertise of others (Mäläskä, Saraniemi, & Tähtinen, 2011). In this regard, SMA can encourage effective content and knowledge sharing between trading partners, thus enabling and enhancing collaboration (Chen, Chen, & Capistrano, 2013; Swani et al., 2014).

In sum, the positive impact of communication performance on business performance has been proven by prior researchers (Kim & Zeelim-Hovav, 2011). Similarly, the communication performance of SMA is likely to be positively associated with SMEs' business performance in the three aforementioned aspects, which leads to the following proposition:

Proposition 1. *Communication performance via SMAs is positively associated with SMEs' performance in a B2B context (i.e., marketing, innovation, and collaboration).*

2.3. SMA capabilities and communication performance

SMA can be defined as highly synchronous as they can easily be used to create and share content of numerous types (e.g., video, audio, or text) and they enable a multitude of simultaneous communications (Kim & Zeelim-Hovav, 2011). In addition, the communication between B2B SMEs mostly involves both the exchange of information (i.e., conveyance) and the development of shared meaning of information (i.e., convergence) (Michaelidou et al., 2011). Hence, SMA's synchronicity is likely to suit SMEs' inter-organizational communication processes. As such, SMA capabilities may directly affect communication performance.

High transmission velocity allows fast information transmission, which makes it possible to conduct continuous communication and gain quick feedback between a sender and receivers (Dennis et al., 2008). As a result, the sender may perceive the communication as efficient because the sender can receive immediate feedback from the receivers, as Agnihotri et al. (2016) indicate in their findings that salesperson responsiveness enhances customer satisfaction. In this way high transmission velocity improves communication performance (Kim & Zeelim-Hovav, 2011). Meanwhile, SMA with high parallelism enables a sender to establish simultaneous communications with multiple recipients, facilitating efficient communication. In addition, SMA with the capability of multiple symbol sets enables the sender and the recipients to communicate with each other naturally and comfortably (Yuan, Hao, Guan, & Xu, 2012). Apart from default symbol sets, there are symbols designed by artists available for purchase as well as free symbols downloadable by the sponsored SMA partners (including banks, insurance, food, airlines, and many other types of companies) for marketing purposes (see an example in Appendix II, the Coco Cola Symbol Set in LINE). Hence, it is likely that symbol sets enhance communication performance.

Therefore, it is proposed that:

Proposition 2. *Transmission velocity in social media apps is associated with the communication performance of SMEs in a B2B context.*

Proposition 3. *Parallelism in social media apps is associated with the communication performance of SMEs in a B2B context.*

Proposition 4. *Symbol sets in social media apps are associated with the communication performance of SMEs in a B2B context.*

Rehearsability enables a sender to craft a message before sending so that the message can be expressed carefully and precisely (Dennis et al., 2008). While rehearsing, the sender can take into account the context of the communication to customize a message to fit the recipients' needs (Tang & Wang, 2011). This is likely to improve the quality of communication between the sender and the recipients. SMA with the capability of reprocessability allows the recipients to re-examine a received message and the sender to re-read and reconsider previously sent messages (Dennis et al., 2008). In this case, reprocessability facilitates the improvement of understanding between the sender and the recipients (Kim & Zeelim-Hovav, 2011). Therefore, it is proposed that:

Proposition 5. *Rehearsability in social media apps is associated with the communication performance of SMEs in a B2B context.*

Proposition 6. *Reprocessability in social media apps is associated with the communication performance of SMEs in a B2B context.*

Based on MST, the conceptual model for this study is proposed, as depicted in Fig. 1.

3. Methodology

The objective of this research is to better understand how SMA affect SME business performance in the B2B context through improved communication performance. To achieve the objective, we are using media synchronicity theory to break down the socio-technical elements in SMA. As this is a study trying to extend the boundary of the existing theory in a new context, we are using a qualitative approach – specifically interviews with key employees – to develop rich field data on how SMA are being used by SMEs and to what effect. This field data is being used to confirm and/or modify the proposed literature-based conceptual model (Fig. 1).

The field data is based on five semi-structured interviews with senior managerial staff of SMEs, which operate in East Asia. Apart from one top manager who has been professionally hired (Case 1), the rest are owners or the successors in their family businesses. The details of the interviewees and companies are highlighted in Table 1. The case organizations include service and manufacturing companies that are involved with and depend on B2B transactions. The people interviewed are senior level people with a good understanding of the business and its use of SMA.

The interview questions were based on the media capabilities of MST shown in Fig. 1. The questions were focused on transmission velocity, parallelism, symbol sets, etc., and how each element related to communicative and business performance. The questions posed were couched in layman terms relevant to the participant: i.e. the first question on transmission velocity was “Can you please comment on the speed of getting responses from your business partners when using social media apps to communicate with them?” Follow-up questions were asked as necessary to clarify or expand on participants' answers.

The interviews were conducted either at the participants' workplaces or off site at restaurants. Each interview lasted from 1 to 2 h and was recorded with the interviewees' agreement and transcribed. Participants' answers were initially coded and analyzed based on the media capabilities of MST and communication and business performance. A second round of analysis examined similarities and differences in the participants' answers as the media capabilities relate to communication and business performance.

As can be seen from Table 1, the companies are using both LINE and WeChat as their social media apps for business communications (both internally and externally). Most of the companies have a Facebook account but do not appear to use it in their B2B interactions. This aligns with SMA usage patterns in East Asia where LINE and WeChat are

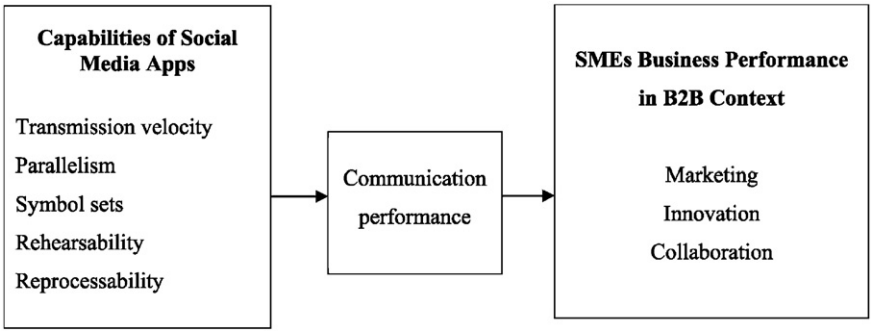


Fig. 1. The conceptual model developed based on the literature.

most commonly used. Based on Statista Inc. (2015), LINE had 205 million active users while WeChat had 549 million active users in the first quarter of 2015. LINE is popular in East Asia (e.g., Japan, Korea, Taiwan, and Hong Kong) while WeChat has been adopted by most Chinese SMA users worldwide. The findings are summarized and discussed in the next section.

4. Findings and discussion

In this section we present and discuss the key findings from the interviews. The findings are presented according to the social media apps' capabilities and in relationship to communication and business performance, in particular marketing, innovation and collaboration. At the end of the section, we will present a modified research model based on the findings.

4.1. Social media capabilities

4.1.1. Transmission velocity

As discussed previously, transmission velocity reflects the speed at which a medium can transfer a message from a sender to an intended receiver. SMA essentially offers instantaneous transmission. But uniquely, compared to many other communication channels, some SMA allow for a kind of 'pre-transmission' presence by allowing users to see who in the network is online and available to receive a communication. SMA also allows the sender to know when the receiver has read a message and respond when they wish. This participant points out several of the benefits of SMA:

> *Basically, everyone can choose to respond immediately or after a while, depending on their relationships, how they use this app, and the configuration. The notification function in the social media apps can be configured differently with different IDs on the friend list. I enable the notification functions (ID) to specify special groupings for business partners and customers.* (P3)

One participant (P3) found both the speed and parallelism capabilities of SMA (LINE) absolutely essential in managing kitchen construction projects with suppliers and customers, explaining:

> *At this moment, social medial apps (LINE) are a MUST in our company and in collaboration with related industrial partners. Most projects are done via social medial apps (LINE) for its speed.*

In sum, SMA, similar to phone calls, allow instantaneous transmission of information, but are capable of much more in being able

Table 1
Case organization demographics.

	Case 1	Case 2	Case 3	Case 4	Case 5
Job title	Manager	Deputy Manager	Executive Secretary for Director	Sales/Customer Service Leader	CEO
Responsibility	Overseeing sales and staff, establishing relationships with customers and partners, attending strategic meetings with the issuance vendor.	Managing the operations at headquarters and in charge of HR, business account management (CRM), online marketing and information systems.	Overseeing sales and procurement above the related managers and reporting directly to the Director.	Internet marketing and sales.	General management and business networking.
Industry type	Insurance agent (as a retailer for large insurance provider).	Manufacturing of metal products for industrial use, e.g., pulley, handwheels, couplings, metal handle, pump and manufacturing tools.	Commercial kitchenware manufacturing and design.	Warehouse management vendor (leasing of lift truck, hangar, etc.).	Business software vendor.
Approx. revenue	US$10 million	US$15 million	US$12 million (does not include its subordinate in China)	US$6 million	US$7 million
Approx. staff no.	50	75	50	100	20
Major business partners	Hospital, bank, insurance provider.	Other manufacturers and suppliers (e.g., suppliers for coil makers, mandrel, bimetal coil, and metal bearing) and business customers in Asian countries and US (mainly) and Europe.	Business partners: restaurants, boat manufacturer, airline, hotels, education institute, and Chef Association.	Metal manufacturers, Association of Truck Drivers.	Industrial associations, major software vendors (e.g., SAP and Microsoft).
SMA used	LINE, WeChat, Facebook.	LINE, WeChat, Facebook (not used much for customers in China).	LINE (mainly) WeChat and What's Up.	LINE (mainly) and Facebook.	LINE, EverNote, WeChat and Facebook.

to instantly transmit other symbol sets such as photos and videos. However, perhaps the most interesting capability of SMA is their ability to establish the 'presence' of recipients both in allowing a user to 'see' who is online and in notifying a user when a message has been read.

These capabilities enhance communication performance by strengthening the conveyance and convergence of information through the fast, focused sending of a wide variety of information and the receiving of responses and feedback.

4.1.2. Parallelism

Parallelism concerns the number of simultaneous communications that can occur through a medium. SMA is highly parallel in a number of ways. Like email, 'groups' can be set up by users and a message with one click can be sent to all members of the group. Unlike most email, the sender can know who has read or not read the message. This feature is useful in marketing scenarios when a new product or price list can be quickly shared with customers. It is particularly effective when sending out an important instruction or change of plan to a project management team involving people from a number of companies or to a group of internal staff or as this participant makes clear:

> *There are also group settings. Whether a message is sent to a group or one person depends on the topics. There can be topics that I wish the team to see or topics that I wish to discuss individually. If some issues are not discussed in group, it can potentially frustrate a team member. We may also exclude colleagues from some discussion groups in order to avoid unnecessary pressures on others. It really depends on topics and the managerial level associated with the topic.* (P1)

Another useful parallel feature of SMA, mentioned above, which is not found in most other communication media, is the ability to establish the 'presence' of both the user and the member(s) of the user's group(s). This presence is a physical feature of the technology and differs from the 'social presence' of other media theories (e.g., Tang & Wang, 2011) where it refers to a subjective feeling that others are involved in a communicative process. This SMA capability to know who is online and available at any given moment can augment timely coordination, advice seeking and other collaborative endeavors as this comment illustrates:

> *So people in the social media group [Project members — both internal and external stakeholders] can understand a project status, raise questions and provide improvement solutions in real time.* (P3)

In sum, parallelism is another strong feature of SMA, which along with transmission velocity, allows users to simultaneously send information to multiple predetermined groups and for members of these groups to respond in kind. Both the conveyance and convergence of information is strengthened and by extension, so is business performance. Our findings did also indicate the possibility of too much parallelism and the need for awareness when sending out sensitive information to groups of people.

4.1.3. Symbol sets

Symbol sets are the number of ways in which information can be encoded for communication. These include written words, spoken words, emojis, pictures, and videos. SMA offer the use of all of these: a significantly wider range of symbol sets than most other media. The value of this flexibility in business performance is demonstrated in this comment:

> *Our company can control the progress quickly and our business partners can check via the images to see if the exhibition settings fulfill their requirements. Progress and images can be shared via the social media apps.* (P3)

The participants mentioned that emojis were useful in certain circumstances. This comment is representative:

> *Usually messages on LINE or WeChat tend to be colloquial discussions and there are many icons available. Those icons can represent our reactions. If there is no time to give a long response, we can send an icon to quickly respond to some messages and follow up when more time allows.* (P5)

While SMA offer a range of symbol set possibilities, it often may be simpler to augment the basic features of SMA such as fast, parallel use of text and emojis with the use of other common media such as voice calls over a mobile phone as this participant indicates:

> *Text cannot express all information so that we will use mobile phone call to communicate if we want to discuss things in detail.* (P4)

Nonetheless, for all the ways that SMA – even augmented by mobile phones – can encode information, according to the participants it is personal face-to-face communication that is often required at some point in the B2B transaction.

> *Business communications will need more than text and icons: face-to-face communication is needed to avoid misunderstandings.* (P4)

> *We mainly discuss key issues via social media apps in group channel with collaborative partners, customers and suppliers. In most cases, the final confirmations about details go back to a face-to-face meeting. And after a sales project is confirmed, some following up items can be discussed or decided in LINE/WeChat.* (P5)

This last comment seems to capture in a nutshell an important aspect of the usefulness of SMA in a B2B context, the setting up of business opportunities as well as the follow up to agreements. While the symbol set is varied and useful in the conveyance and convergence of information, it seems that face-to-face communication is still necessary to conclude important business.

4.1.4. Rehearsability

Rehearsability is the extent to which the medium enables the sender to rehearse or fine tune a message during encoding and before transferring it. Similar to email, some SMA allow for the drafting of messages before sending for both senders and receivers, but are more rehearsable than a phone call, particularly for the receiver as these comments illustrate:

> *Messages in social media apps can be drafted before sending out. And after sending out, it can leave enough time for the receivers to think what to respond comparing to telephone call. It is a convenient way to contact vendors and customers.* (P1)

> *This type of app has better flexibility comparing to email, telephone or face-to-face. You could say that its position is in between. You could use this for real time communication but also possible to answer this with more time to think and prepare before responding to the other side.* (P2)

As we see from the following cautionary comment, the SMA capabilities of transmission velocity, parallelism and symbol sets must be tempered by the mindful use of SMA, as the potential for mistakenly releasing important information or critical comments to many people is always present.

> *Not all social media apps have drafting functions. Therefore, the conversations/responses via the social media apps are very colloquial. We have to be very careful who is in the project group and about what we say.* (P3)

Many, though not all, SMA have the capability of rehearsability and this can contribute to communication performance by allowing senders and receivers to think before communicating, though this may not always be the case. In situations where care is not taken then the (other) capabilities of SMA may lead to greater damage to business performance than other media.

4.1.5. Reprocessability

Reprocessability refers to the extent to which the medium enables a message to be re-examined or reprocessed during or after the communication. SMA provides a linear time-oriented record of individual and group conversations. According to one participant, this makes it easy to track down information "*since the history is kept by each group or individual ID*" (P2), but the participants were unanimous that SMA was not as useful in keeping track of important information as some other media, such as email. The participants all agreed that all-important information contained in SMA conversations must be purposively transferred to more formal and permanent locations as these comments indicate:

> *After the conversation via social media apps, we still use email and official documents to process the work. Notably, the draft of our official documents (via Word or PDF) may be sent by our suppliers/customers (or we send to them) for discussion before we confirm the final version of official documents.* (P3)

> *We still have other channels such as email or enterprise systems to keep official transactions and documents. In other words, the social media record is simply a personal reference.* (P2)

> *Most social media apps are not convenient for message reprocessing. Thus we use other apps to help archive important information.* (P5)

The communicative value of SMA is in the initiation of conversations and the progressing of business opportunities. As far as reprocessability of critical information is concerned, SMA does not yet meet the formal reporting requirements of business. The process is illustrated in this comment:

> *Our staff recognize conversational records in the social media app and our customers and suppliers will act/expect accordingly to what we promised via social media app. In the end all the commands will be recorded and executed with normal document flows in the ERP.* (P3)

Reprocessability may be the weakest capability of SMA. Any important communication related to business will need to be accounted for and at present this is not a feature of SMA. Saving SMA communication requires special efforts on the part of businesses.

4.1.6. Security

Another weakness of SMA that emerged in this study is security. This is discussed in the next section. One critical aspect of business communication conducted via SMA, but not accounted for by MST and the proposed research model, is information security. The literature (Agnihotri et al., 2016; Kwahk et al., 2012) and the popular press are full of accounts of information leaks and hacks forwarded across the globe at the speed of a 'click' (e.g., Ashford, 2015). Because of the criticality of information security in business and the recent media attention to it, we specifically asked our participants about the security issues surrounding SMA in B2B use. A number of concerns were voiced.

It is understood by the participants that while SMA are free and easily accessible, making them ideal for marketing and communications, at the same time they are not generally designed on secure platforms and are not particularly well supported by the SMA vendors. Moreover, these SMA vendors may retain access to users' communications and other posted information, which some participants saw as a significant issue. Finally, the devices (mobile phones) that use SMA and retain information are often the property of the users and often beyond the control of the business as this participant noted:

> *Our company cannot control staff's use of LINE or WeChat as they belong to personal property (their mobile phones). So it would be hard to trace [a leak].* (P3)

Most of the participants also mentioned the inability of a company to contain the spread of information once it was sent out, even to intended recipients. SMA allows the instant dissemination of information. If critical information is mistakenly transmitted or sent to an unintended recipient (who, for example, may be part of a larger group list) it is not possible to get it back. Moreover, as one participant mentioned, the devices are small and "*the slip of a finger when using SMA could inadvertently leak information*" (P5).

While the companies used group settings to limit the recipients of information, as one participant noted, nothing stops a recipient from forwarding on the information:

> *We have heard that other companies had information leaked to people outside the company. It is too easy to forward data in social media apps, compared to corporate emails, which are recorded on the company server.* (P3)

When the issue of security came up in the first interview, we pursued it with follow up questions and in the following interviews. It became apparent that security is an issue with the use of SMA in B2B. As explained in this section and as can be seen in the sections on the capabilities of SMA, each of the capabilities of SMA – such as speed and parallelism – have a potential downside when SMA are used carelessly or even maliciously. This risk inherent in SMA may be even more pronounced in SMEs as these companies may not have the legal, human and technological resources to monitor and enforce the responsible behavior of employees, contractors, business associates and customers.

4.2. Communication performance

The data show that SMA provides strong support for the conveyance and convergence of B2B communication for SMEs. LINE is reported as being "*quick and fast*" (P4), allowing effective transmission of information. SMA are also recognized as "*good two way communication channel(s)*" (P4), which facilitate back and forth information exchange between two parties towards reaching a mutual understanding. Two participants pointed out that:

> *(LINE allows) two way immediate communication or the response after receiving the senders' message for a while.* (P3)

> *You could use this for real time communication but it is also possible to answer this with more time to think and prepare before responding to the other side.* (P2)

With robust information transmission and successful information processing, effective communication performance is seen as critical for achieving efficient business performance for SMEs. This is especially the case for business performance in marketing, innovation, and

Table 2
MST, communication performance and business performance: summary of findings.

Social media capabilities	SMA use and relevance of MST	Conveyance & convergence	Communication performance	Business performance	Other
Transmission velocity	Confirmed. Speeds are fast.	Fast 'push' messages to many, plus confirmation that messages have been read.	Confirmed in velocity but information security (leakage) becomes a concern.	*Marketing* Examples of SMA being used in marketing and customer relationship management.	Ability to confirm messages have not been read may be a new aspect of SMA and MST.
Parallelism	Confirmed. Useful for real time communication to one or many. Flexibility to develop groups and lists and include or exclude people as necessary. Can broadcast files to many.	As above. Convergence may also be assisted via group discussions.	Generally helpful in supporting communication Possibility of too much unregulated communication.	*Innovation* Examples of using SMA in design stage of manufacturing and project management. *Collaboration* Strongest use of SMA is collaboration and coordination of a wide range of business processes.	Possibility of too much parallelism that needs to be regulated through hierarchy of friends list, etc. Not reliable for data storage and not safe for confidential information; must be careful not to broadcast such information over group lists.
Symbol sets	Limited confirmation. Texts and pictures (including emojis) are helpful, but still limited compared to face to face.		Written communication, photos and video, and emojis are helpful, but decisions are usually finalized in face to face discussion. Informal, colloquial language is common.		Face to face meetings generally required to finalize important decisions. Possibility messages may be misconstrued Tone of messages could be an issue.
Emojis Rehearsability	Confirmed. Some SMA, such as LINE, allow for writing messages before sending an acknowledgement can be quickly given with a simple message or an emoji.		Response can be postponed till ready. The communication can be real time as well as periodically pending on the users' will, though normally the reply will not take too long to happen in business.		
Reprocessability	Limited confirmation. Excellent for real time sharing of information. Generally inferior to other options (e.g. email) for locating and reusing information.	Excellent for forwarding documents, dialog.	Useful in real time communication; the SMA does not provide reprocessability but the content can be easily extracted to be processed by other software/apps with other machines. Security is an issue.		Most important information generated on SMA must be purposively transferred to other organizational information systems.

collaboration in the B2B context. In this study, the enhanced communication performance through SMA is found to positively affect business performance in the three aspects. One participant confirmed that communication performance successfully implemented the marketing strategies of the company:

> *We use this (social media app) for initial sales inquiry, product specification; as those apps are on smart phone, I could show the prospective customers real time images and photos.* (P2)

At the stage of service and product innovations, a company can communicate with potential customers via SMA. Trial versions of the innovations can be realized in order to collect customer feedback, which could be useful to further improve innovation. This important purpose is to ensure that the service and product innovations of the company can be executed properly, as participant P4 mentioned:

> *We now very often use social media apps in the design stage for customer services and product. We use this for continuous communications to adjust our services to meet customers' manufacturing procedures since our services are related to the transportation and warehousing of semi-final products and final products. Our products/services will get changed whenever there are changes in the customers' side.*

Furthermore, effective communication is essential in managing collaborations with partners. Participant P3 explained that:

> *For industrial partners, we use this (social media app) for sharing of business opportunities, collaborations in product exhibitions. … Our collaborative partners in the social media group can understand a project status, raise questions and provide improvement solutions in time.*

Our participants confirmed communication performance positively affects business performance.

4.3. Discussion and implications

Table 2 summarizes the main findings from this study. The findings generally support MST and its relevance in explaining how SMA capabilities can enhance communicative and business performance for SMEs in B2B applications. The five capabilities of MST – transmission velocity, symbol sets, parallelism, rehearsability, and reprocessability – are all apparent in SMA use in SME B2B communication. We can conclude that all the SMA capabilities can add to communication performance and hence business performance, particularly in the area of collaboration. As noted, however, reprocessability is a weak capability and represents a possible cost to business in SMAs' current form. Moreover, the findings suggest that SMA must be used mindfully as mistakes involving the communication of

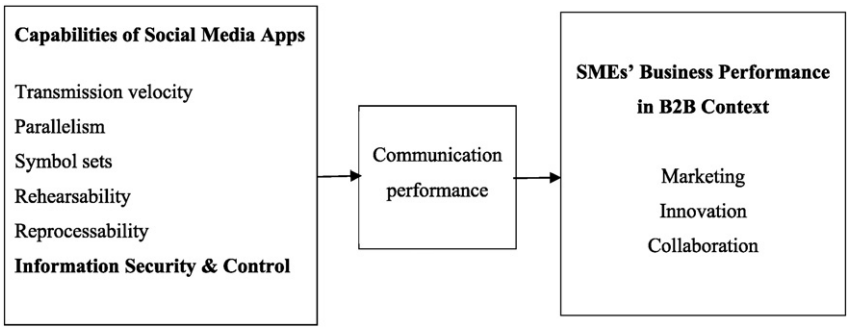


Fig. 2. The revised model based on findings.

information and the recipients of information can be amplified through carelessness.

The misuse or careless use of SMA as well as a lack of inherent security features in current versions suggest the use of SMA in SMEs' B2B communications must be tempered. With regard to MST, we know MST proposes a framework to understand the capabilities of media in an objective way (Dennis et al., 2008) and specifically does not account for "socially derived characteristics, whose salience is influenced by prior experience and context of use" (p. 576). Therefore, our findings pertaining to risks of SMA in terms of careful (or not) use may not directly affect MST's validity as these can be understood as involving users' prior experience. Nevertheless the inherent lack of security features as manifested in current forms of SMA are not objectively accounted for in MST although this is potentially a major factor in communication and business performance at least according to our findings involving the SMEs' B2B context.

> *Security is a weakness of such tool. The quotation from suppliers or our quotes can be easily leaked out via LINE or WeChat.* (P3)

> *Security is the major issue for using social media tool. Hence, classification and group settings of users are very important. Even so, it is impossible to avoid information being sent forward to others outside the designated group. Just a simply finger slide, any information might be leaked out.* (P5)
>
> *Yes, security and upgrade are really concerns for business communication with social media apps. Receivers can send forward confidential documents and communication records easily to others. Unlike email records, people can easily create an account in those social media tool to get confidential documents. No one can really guarantee security that there is no proper mechanism to ensure security. So it is necessary that we have to be careful and selective of things to send to and share with.* (P1)

During the interview, more than half of the interviewees mentioned that if SMA can increase its security features' reliability, they would be willing to increase the usage of SMA in B2B communications. So far, SMA use is affected by SMA's current forms and features, which do not provide sufficient technological mechanisms for information security management. We believe that enhanced information security control can help to increase communication performance and thus increase business performance.

In order to address this issue of security, we have adapted the proposed research model (Fig. 1) to account for this missing medium capability in MST. The revised model is shown in Fig. 2, which indicates the potential influence on communication performance by the capability — 'information security and control'. Examples of possible indicators for this capability can be the security policy of an organization, technology support readiness to ensure a secure environment, and staff behavior.

5. Conclusions

Based on media synchronicity theory (MST), this paper has presented an exploratory study investigating how the use of SMA affects communication and business performance in SMEs in the B2B context. The findings suggest that communication performance is likely to enhance business performance in terms of marketing, innovation, and collaboration. In addition, the findings from this study confirm that the five capabilities of SMA seem to be strong indicators of B2B communication performance. Future research can apply the model to large companies or to different regions.

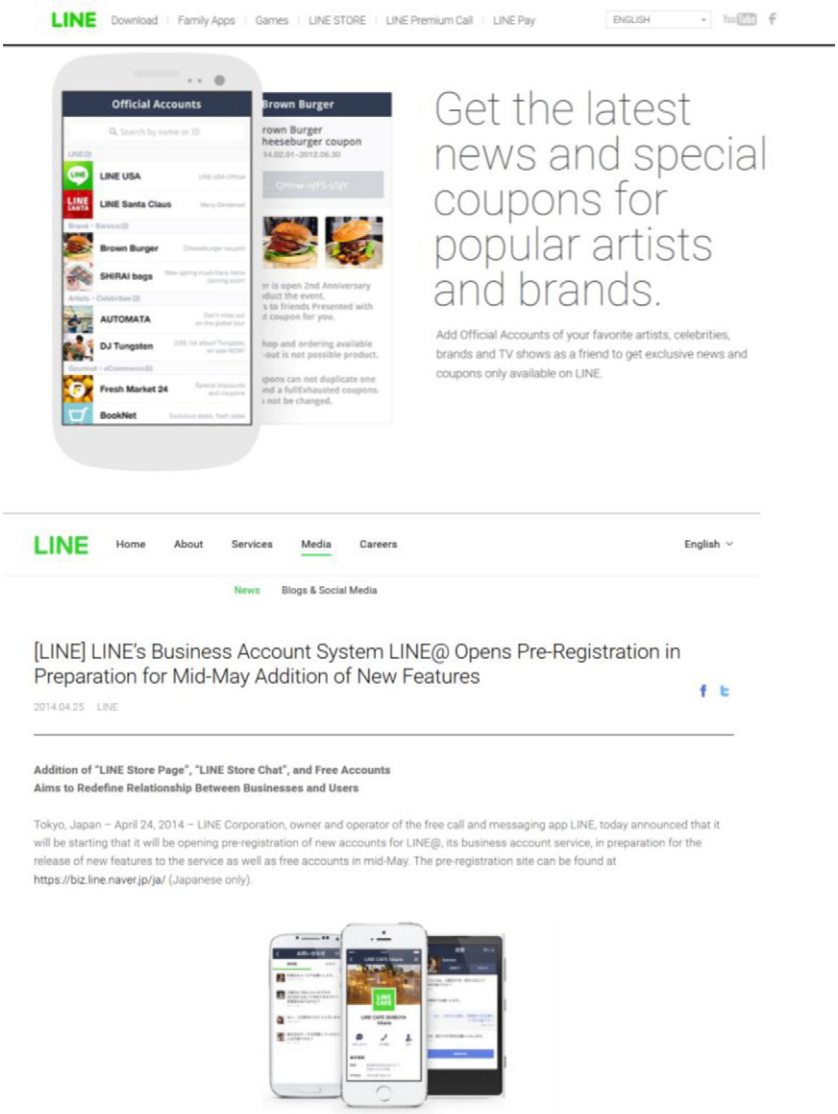
In addition, this study extends MST by adding security as another capability of SMA, which, according to the study's findings, is likely to affect communication performance. We recognize that the change being proposed for MST is limited to the findings from this study involving a qualitative design with a small sample, applicable to the SMEs' B2B context. Although the proposed security capability makes sense given all we know in the social media environment, a full survey would be necessary to test the model.

The findings of this study also indicate possible managerial implications, particularly in information security management. As security concerns about SMA seem to hinder the most effective use of SMA by SMEs in the B2B context, companies are encouraged to develop practical strategies to ease such security concerns of users, for example by setting up policies and improving SMA to align with existing communication platforms. SMA providers may also want to consider ways of enhancing security features for their business customers.

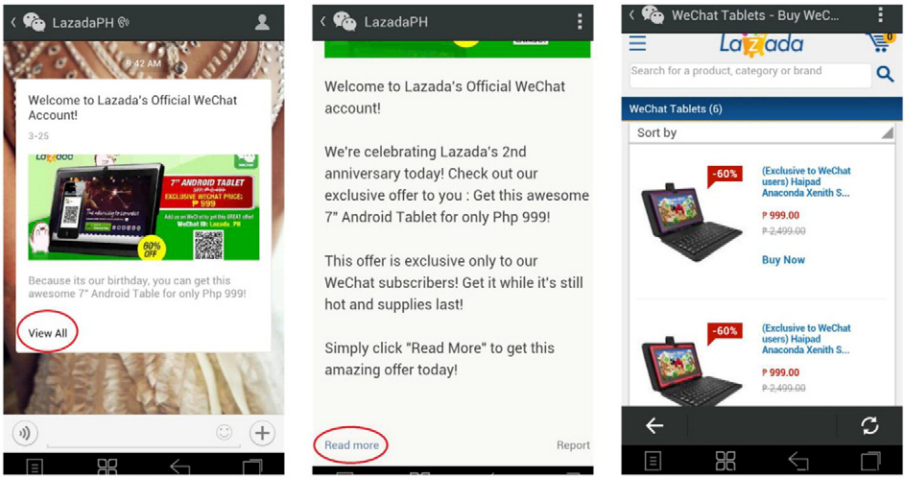
Future research can be conducted to confirm the proposed model with large samples to validate the links among constructs. It can include the development of model measurements, different contexts of research, and adding the newly suggested factor of information security and control for testing. Moreover, other theories (e.g., 'presence' in the media) and online tools may be applied to explain B2B communication from different perspectives or in various contexts (e.g., large enterprises, supply chain, different regions and industries).

In sum, as this paper demonstrates, business outcomes are brought about using SMA in the B2B environment. Companies might want to consider using SMA to increase collaboration in addition to branding and promotion. This could involve developing SMA related strategies, investments, and policies to enhance their B2B activities.

Appendix I. The Business Accounts used in SMA (LINE and WeChat)



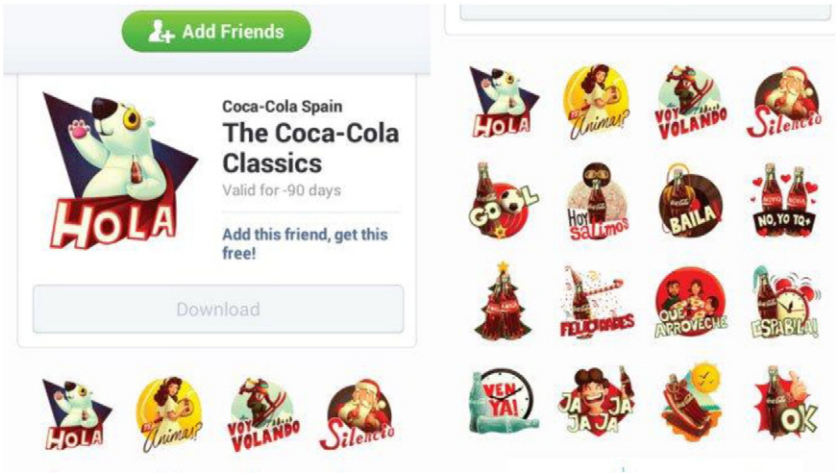
Source: http://linecorp.com/en/pr/news/en/2014/729. Updated 30 March, 2015.



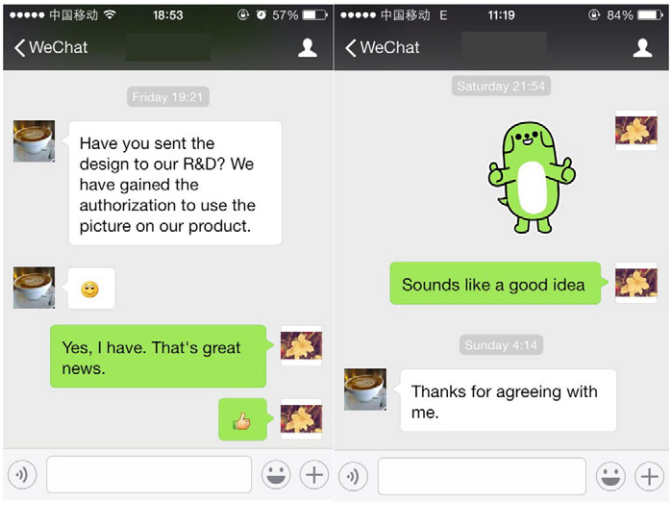
Appendix II

Symbol sets that can be used in the communication dialog of SMA (examples of LINE and WeChat).

Free symbol set provided by a company utilizing this as a marketing tool.



Inter-organizational communication with symbols.



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