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Social Media Assimilation in Firms: Investigating the Roles of Absorptive Capacity and Institutional Pressures

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Abstract

Firms are increasingly employing social media to manage relationships with partner organizations, yet the role of institutional pressures in social media assimilation has not been studied. We investigate social media assimilation in firms using a model that combines the two theoretical streams of IT adoption: organizational innovation and institutional theory. The study uses a composite view of absorptive capacity that includes both previous experience with similar technology and the general ability to learn and exploit new technologies. We find that institutional pressures are an important antecedent to absorptive capacity, an important measure of organizational learning capability. The paper augments theory in finding the role and limits of institutional pressures. Institutional pressures are found to have no direct effect on social media assimilation but to impact absorptive capacity, which mediates its influence on assimilation.

Keywords

Innovation; Information systems assimilation; Institutional theory; Absorptive capacity; Social media; and Web 2.0.

Introduction

Social media technologies such as social networks, wikis, and blogs are one of today's major technology trends.[1] Facebook has developed into a network of over 900 million users (Carlson, 2012), and LinkedIn now has 161 million members in over 200 countries and territories.[2] McKinsey found that a majority of large firms reported using social media in their organizations and a majority claimed to have measurable gains from using these technologies (Bughin & Chui, 2010; Bughin and Chui, 2013).

Firms recognize social media as a priority, yet are grappling with ways to employ it strategically. Initial efforts in implementation stall in organizations because of their inability to harness their "motivated, curious and cross-functional" employees (Blanchard, 2011). Social media is employed by multiple departments such as marketing, public relations, customer support, and design. Winning support among employees and the customer community and integrating it across multiple business units can be challenging. Firms need to develop a knowledge and innovation community that cuts across multiple departments and the customer community to exploit the potential of these technologies (Bharati et. al., 2012; Li & Bernoff, 2011). Despite these challenges, management scholarship on social media use by enterprises is just emerging.

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1 "A fistful of dollars," *The Economist*, February 4, 2012.

2 URL: press.linkedin.com/about (Retrieved July 9, 2012)

This paper is part of the research stream that studies IT assimilation at the firm level. Enterprise-wide IT adoption has been researched for technologies such as electronic data interchange (Ramamurthy & Nilakanta, 1994), telecommunications technology (Grover & Goslar, 1993), smart card payment systems (Plouffe et al., 2001), advanced software technologies (Fichman, 2001, Tian et al., 2010), electronic data interchange (Teo et al., 2003), and enterprise resource planning (Liang et al., 2007). These technologies have some common characteristics: they require large upfront investments in software, hardware, and IT infrastructure and they impact large parts of the enterprise. They are often major strategic investments, as they impact a firm's performance and are led by top management who cannot afford to risk failure. It is mandatory for the user community to fall in line where these technologies are concerned. These information technologies are also transaction-oriented (such as ERP or e-commerce) or facilitate transactions using EDI or smart cards. In contrast, social media technologies have a different profile. Almost no investment in internal IT hardware and infrastructure is required, as social media runs on publicly available platforms such as LinkedIn and YouTube. Organizations start small, and initiative is often led by smaller skunk-works and task forces running at a department level. For social media, the firm relies on curious employees and digitally savvy executives to provide the initial thrust and promotion (Blanchard, 2011). Top management plays the role of a champion and influencer. Finally, social media, as the name implies, is a technology that is not focused on transactions but on collaboration and communication across groups both inside and outside the firm. Research on organizational-level adoption of enterprise-level technologies with collaborative features of social media is limited. This is one of the first papers that studies not merely adoption but assimilation of social media at the organizational level.

A steady stream of research has established the roles of firm size, top management support, and IT budgets as determinants of IT adoption at the firm level (Jeyaraj et al., 2006, Shin et al., 2010). Some of this research has been driven by a diffusion of innovation perspective that looks at characteristics of both the technology and the organization (Rogers, 2005). Cohen and Levinthal (1990) introduced the organizational learning perspective, where factors studied were primarily related to organizational characteristics. Fichman (2001) studied the relationship between knowledge acquired by a firm, as measured in terms of specialization and related knowledge, and the assimilation of advanced software technologies. A study on organizational assimilation of component-based software development showed that technological knowledge may lead to a higher degree of post-adoptive use of the technology (Ravichandran, 2005). Zhu et al. (2003) used a technology, organization, and environment (TOE) framework to establish the roles of consumer readiness and competitive pressures as significant determinants of IT adoption at the firm level; their study was one of the earliest to investigate how environmental factors affect a firm. More recently, focus on the environment has become theory-driven. Institutional theory (DiMaggio & Powell, 1983) provided a framework for studying the impact of institutional pressures on organizations that resided in an institutional field. Dacin et al. (2002) used institutional theory to map how institutions change over time. Geels (2004) used institutional theory to model how institutional forces drive the innovation process among a network of firms.

In the field of information systems (IS), Teo et al. (2003) studied the adoption of electronic data interchange using institutional theory as their framework. Liang et al. (2007) extended that research to include the role of top management as a mediating factor between institutional forces and the firm to investigate assimilation of enterprise resource systems (ERP) in China. Saraf et al. (2012) extended the same study by exploring the moderating role of absorptive capacity on assimilation of ERP. Using the findings of Teo et al. (2003), Liang et al. (2007) and Saraf et al. (2012), we submit that institutional pressures play a role in promoting assimilation of social media. We use the term *assimilation* instead of *adoption* because it better captures the extent to which the technology is used and its realized benefits (Liang et al., 2007).

There is a rich vein of literature examining firms' absorptive capacity and innovativeness. Absorptive capacity is a firm's learning ability. Cohen and Levinthal (1990) were first to define absorptive capacity as a firm's ability to identify, assimilate, and transform knowledge; they highlighted the critical role it played in firm-level innovation. Different variants of this concept have been used in IT research literature on IT-related innovation (Roberts et al., 2012). Given that social media assimilation depends so much on employee-level initiatives and on the digital-savvy nature and creative capacity of employees, this paper introduces the concept of absorptive capacity to capture the innovation ability of a firm. Given that institutional forces have been frequently used in general management and IS research as drivers of innovation, our model posits that institutional pressures impact the learning capacity of a firm as measured by its absorptive capacity, which in turn impacts social media assimilation in the firm.

In short, this research makes the following contribution: It is one of the first papers on organization-level assimilation of a non-transactional and collaborative yet enterprise level technology such as social media. It extends the use of institutional theory in IS innovation to include the mediating role of absorptive capacity. Finally, it is the first paper to establish institutional pressures as antecedents of the absorptive capacity of a firm, which is an important measure of the firm's organizational capability.

Research Question

The paper focuses on the question, "Do institutional pressures impact the absorptive capacity of firms and assimilation of social media technologies, and is this assimilation mediated by absorptive capacity?"

The rest of the paper is organized as follows: The next section sets out the research model. It is followed by a section describing the conditions and context in which this research was carried out. Managerial implications, possible directions of future research, and preliminary conclusions are discussed in the last few sections.

Theoretical Framework

Institutional Theory

Organizations are viewed as specialized arenas in an institutional field (DiMaggio & Powell, 1983) that are comprised of regulative, normative, and cultural cognitive elements (Scott, 2008). Institutional theory has been studied and applied at various levels of aggregation: individual organizations and organizational subsystems, organizational fields and populations, and societies and the world (Scott, 2008). Institutional theory has traditionally been used to describe how individual entities in an institutional field, in the context of their environment, face pressures to conform to shared behavior and norms, and how that shapes their decisions over time, leading to a certain isomorphism in behavior and structure. DiMaggio and Powell (1983) distinguish between three types of isomorphic pressures that act on a firm and that originate in the institutional environment: coercive, mimetic, and normative. Coercive isomorphism is when firms conform to external pressures exerted upon them by other organizations upon which they are dependent, such as government, industry associations, professional networks, and powerful clients and suppliers. Mimetic isomorphism is when firms mimic other organizations in order to cope with uncertainty and save on search and other learning costs. It is often associated with the bandwagon effect, as described by Staw and Epstein (2000). Normative isomorphism arises through professionalization that leads to members of a certain profession holding a common set of norms, values, and cognitive models (DiMaggio & Powell, 1983).

The focus of institutional theory has expanded beyond factors that lead to isomorphism and homogeneity to institutional forces that drive change. Change in institutional fields that is initiated at the field level has been studied by Hinings et al. (2004). While historically, institutional theory has looked at the population level and organizational learning theory at the organizational level, the two areas have been converging as far as the level of analysis is concerned (Haunschild & Chandler, 2008). Haunschild and Chandler (2008) describe how Walmart, being part of the population of retailers, learned from the experience of other retailers and adopted green initiatives as a result of both societal pressures and the need to improve efficiency. Greenwood and Suddaby (2006) noted the role played by reform agents as sources of change in institutional fields.

Institutional theory, with its focus on the environment of the firm, provides us with a theory on how members of an institutional field could be playing a role in adoption and usage of new technologies. Bughin and Chui (2010) describe the emergence of networked enterprises through the use of social media technologies. The most prominent uses of these technologies they found in their survey were linked to establishing new channels of communication and commerce between a firm and its business partners, such as customers and suppliers. The role of business partners such as consultants and vendors in the assimilation process has been observed by Hirt and Swanson (2001), and Somers and Nelson (2004) also point out the important role of entities external to the firm. Following Liang et al. (2007) and Teo et al. (2003), who used institutional

theory constructs as their independent variables in their study of IT adoption and assimilation, this paper uses mimetic, coercive, and normative pressures as the primary set of independent variables (Figure 1).

Absorptive Capacity

Absorptive capacity has emerged as a critical concept in innovation literature (Zahra & George, 2002). There is extensive literature on institutional innovations in different fields, such as public policy, industrial studies, and administrative studies, that uses the concept of absorptive capacity (Leahy & Neary, 2007). A substantial body of research finds that absorptive capacity contributes both directly (Lichtenthaler, 2009) and indirectly (Lane et al., 2006) to firm performance. In IS research, absorptive capacity has been applied in a diverse range of research streams, such as knowledge management (Alavi & Leidner, 2001), IT governance (Sambamurthy & Zmud, 1999), IT innovation (Fichman & Kemerer, 1997), and IT business value (Bhatt & Grover, 2005). Within the context of interorganizational systems, organizations can build IT-enabled absorptive capacity supply chain configurations that allow them to process information obtained from their partners to create new knowledge (Malhotra et al., 2005).

According to Cohen and Levinthal (1990), the absorptive capacity of a firm is its ability to identify, assimilate, and exploit knowledge from the environment. Since absorptive capacity is identified as ability, it is not subject to direct measurement but is measured through popular proxies such as R&D activity (Leahy & Neary, 2007), stock of existing knowledge (Cohen & Levinthal, 1990), and organizational structures, routines, and human management practices (Gadhfous, 2004). In the field of IS research, the popular proxies for measurement of absorptive capacity have included related prior knowledge in the firm (Liang et al., 2007), factors such as managerial proclivity to change and technology policy (Teo et al., 2003), and the ability to identify and integrate external knowledge (Ettlie & Pavlou, 2006).

According to Roberts et al.'s (2012) survey paper, firm-level absorptive capacity has been viewed both as a "stock" of prior related knowledge and as an "ability" to absorb new knowledge. The existing knowledge base of a firm impacts the firm's ability to identify and absorb external knowledge; without such a knowledge base, it "will not be able to accurately determine the potential value of external knowledge" (Roberts et al., 2012). In the field of IS research, Fichman (2001), Liang et al. (2007), and others have adopted the stock perspective for measuring absorptive capacity of a firm. In the field of social media, Lotus Notes was a pioneering technology that enabled communication and knowledge sharing among employees and customers. Similarly, at the turn of the century, firms were using the emerging web services technologies to develop in-house collaborative systems such as messaging services, bulletin boards, and document sharing systems (Boulos & Wheelert, 2007). We have used implementation and use of Lotus Notes and web services as a measure of a firm's stock of related technologies.

Ettlie and Pavlou (2006) adopted the ability view in IS research, emphasizing a firm's ability to identify, integrate, and exploit external knowledge. In support of the ability view, Lane et al. (2006) provide a process-based definition of absorptive capacity through the sequential processes of exploration, transformation, and exploitation. Exploratory learning is a process of knowledge acquisition from the environment (Zahra & George, 2002), exploitative knowledge is knowledge of how to apply the acquired knowledge (Zahra & George, 2002), and transformative learning links the two processes together to help maintain knowledge over time (Garud & Nayyar, 1994; Lichtenthaler, 2009). In order to incorporate the ability view of absorptive capacity, our measure for absorptive capacity includes items related to identification, importation, and integration of new knowledge into existing knowledge. Given the role of the absorptive capacity concept in explaining innovation at the firm level, we have chosen to use absorptive capacity as a factor that mediates the effect between pressures at the institutional level and firm-level decisions relating to IT innovation (Figure 1).

Research Model and Hypotheses

Institutional Pressures and Absorptive Capacity

Organizations with prestige have the legitimacy to act as initial adopters (Rogers, 2005). Moreover, market feedback about successful firms and their modes of operation shapes managers' cognitive premises directly through exposure and indirectly through other intermediaries such as consultant firms and authors, thus providing the necessary mimetic and normative forces for conformity to innovation adopted by star performers (Lee & Pennings, 2002). Fosfuri and Tribo (2008) show that cooperation is a key antecedent for firms' absorptive capacity and promotes sharing and copying of best practices among firms. Thus,

H1-A: A higher level of mimetic pressure will lead to greater absorptive capacity.
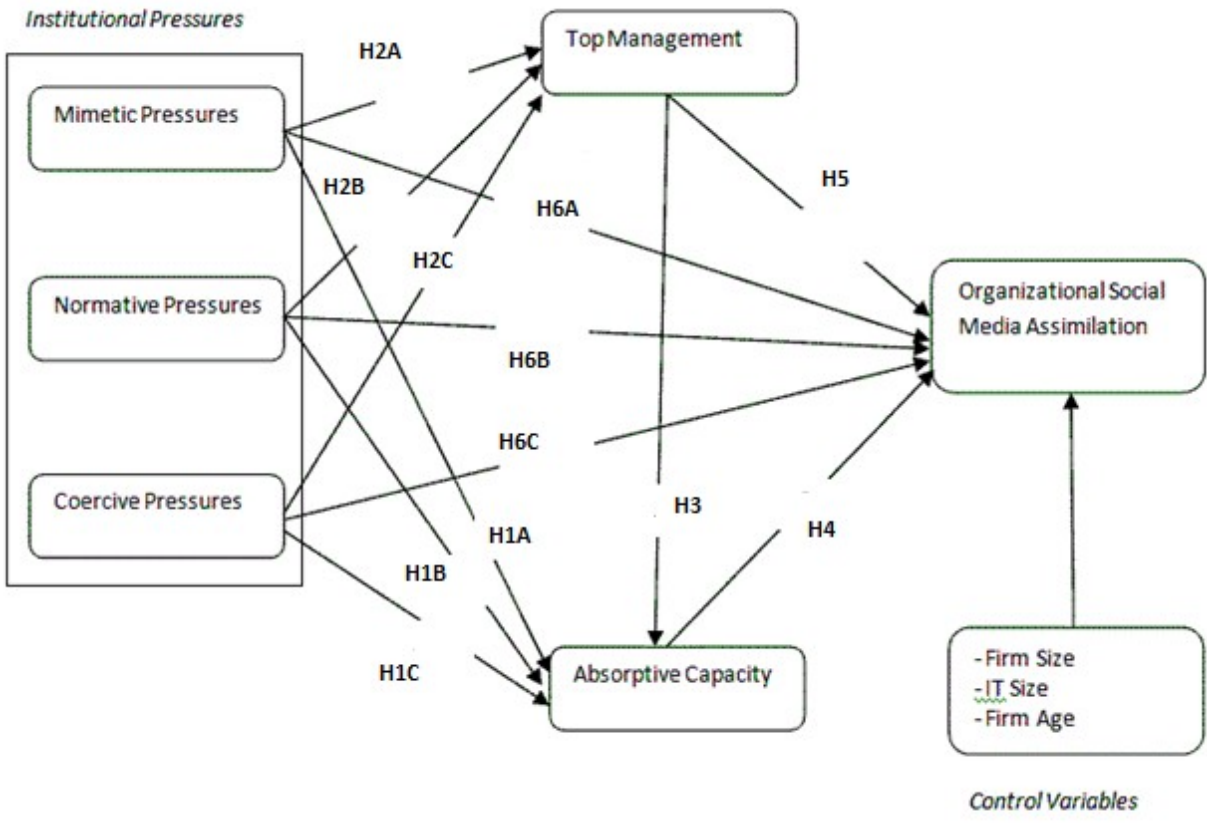
Figure 1: Hypotheses

According to Kondra and Hinings (1998), firms that perform well above institutional norms are often the source of new norms; these renegades may include new firms that have novel operational models because they have not been subject to the forces of isomorphism for long. They could also be existing firms that have deviated from norms knowingly (active agency) or unknowingly (passive agency). Organizations that are weakly bound to field norms are more willing to risk transgression of norms and operate in a manner that allows superior performance. They may also be firms that have found novel ways to react uniquely to exogenous pressures and shocks (Fligstein, 1991). Some of these exogenous pressures may originate in the marketplace, such as consumer-driven change, increasing competition, and changes in regulatory environment (Kondra & Hinings, 1998). Over time, according to Fligstein (1991), they become a new source of legitimacy and new norms. "Legitimacy is contagious" (Zucker, 1988, p. 38), and there is a spread of legitimation, more so when the organizational field is tightly integrated. Hinings and Greenwood (1988) suggest that these firms establish themselves over time as "leading organizations" in the field. DiMaggio (1991) characterizes institutional fields in terms of

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dimensions related to professionalization (Larson, 1977) and dimensions related to structuration (Giddens, 1979).

In terms of professionalization, DiMaggio (1991) uses factors such as (a) creation of a body of knowledge, (b) organizations of professional associations, and (c) consolidation of a professional elite to demonstrate how the Carnegie Corporation facilitated the development of the organizational field of U.S. art museums. More recently, IBM has been promoting the concept of service and process management at universities such as North Carolina State University, which recently developed the first MBA program in the field.[3] One of the major subfields in the proposed area is that of managing vendors engaged in outsourcing activities—"emphasizing the management of relationships between service providers and their clients." This professionalization helps legitimize the subject and its subsequent widespread application in science, business, and engineering. According to Zahra and George (2002), ability to absorb new information, a measure of absorptive capacity, depends on degree of shared codes and norms. Cohen and Levinthal (1990) identify shared norms and knowledge among firms as influencing their knowledge acquisition ability. Hence,

H1-B: A higher level of normative pressure will lead to greater absorptive capacity.

Organizational learning is often triggered by shocks in the environment leading to involuntary learning by firms (Kadtler, 2001). These triggers can be viewed as jolts that can stimulate innovation within a firm. Such a jolt appears disruptive, but without it there is no coercion to abandon existing practices and routines (Van de Ven et al., 1999). There are many kinds of triggers. Foreign ownership of firms may compel them to adopt newer corporate structures and routines that are similar to the parent firm's (Dorr & Kessel, 1999). Social movements by Greenpeace compelled Royal Dutch Shell to decentralize decision-making to a Nigerian subsidiary and evolve into an organization that was sensitive to the needs of the local population (Kadtler, 2001). Privatization and opening of markets in former communist countries like the GDR forced their companies to shed their bureaucratic mode of operations and adopt newer practices that could survive competition from firms in the West (Dorr & Kessel, 1996). Since changing practices and knowledge bases are all taken as proxies for measuring absorptive capacity, we posit:

H1-C: A higher level of coercive pressure will lead to greater absorptive capacity.

Institutional Pressures and Top Management Support

The principal hypothesis of Liang et al. (2007) concerned the impact of mimetic, normative, and coercive institutional pressures on top management in the context of technology assimilation. They argued that because top managers were the decision-makers, they provided the micro-link between the macro-level phenomena of institutional pressures and firm-level behavior.

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3 http://poole.ncsu.edu/news/2006/mba_ssme.php (August 15, 2012).

According to Teo et al. (2003), top management exhibits a tendency to imitate the actions taken by other structurally equivalent organizations. Firms are subject to coercive pressures from their customers and vendors, and according to Liang et al. (2007), top management members are the focal point of these coercive pressures and forced to adapt to them. Normative pressures usually move through professional channels and affiliations. However, top management members often play a boundary-spanning role and shape and influence other firms through professional networks.

Following Liang et al. (2007), we posit that

> H2-A, B, C: Higher levels of (a) mimetic, (b) normative, and (c) coercive institutional pressure will lead to top management support for technology assimilation.

Top Management Support and Absorptive Capacity

Absorptive capacity is a firm-level ability and is observed or measured through innovation-related outcomes such as product innovation, changes in business model, acquisition of new markets, and new organizational structures and processes (Dagfous, 2004; Leahy & Neary, 2007). The business media is usually full of news relating to top managers, including CEOs, leading efforts toward innovation in a firm. For instance, in a single issue of *Business Week* (covering the week of January 24-January 31, 2011), we have articles relating to Steve Jobs leading product innovation at Apple, top managers at GM remaking the culture at the firm, the CEO of EMC helping the firm to become a service-oriented company, and the Netflix CEO moving toward a different business model. Therefore, we can hypothesize:

> H3: A higher level of top management support will lead to enhanced absorptive capacity

Absorptive Capacity and Social Media Assimilation

According to Cohen and Levinthal (1990), the innovation capacity of a firm is determined by its absorptive capacity because a firm with high absorptive capacity is better able to search for, adopt, and implement an innovation. Malhotra et al. (2005) argue that firms use absorptive capacity to sense changes in their environment and respond to these changes. A firm with higher absorptive capacity is better able to sense changes in its environment, explore available alternatives, adapt solutions that are available, and thus exploit innovation to meet its needs (Zahra & George, 2002). In the field of IS research, Liang et al. (2007) related a firm's absorptive capacity to its success in implementing ERP. Teo et al. (2003) have shown a positive relationship between a firm's absorptive capacity and its assimilation of financial electronic data interchange, an inter-organizational technology. Therefore, considering that we are concerned with social media, which is a tool for networking between a firm and its partners, we hypothesize:

H4: A higher level of absorptive capacity will lead to greater assimilation of social media technologies.

Top Management Support and Social Media Assimilation

The IS research literature is replete with evidence that top management's support is crucial for technology assimilation. Chatterjee et al. (2002) have established the role of senior management. More specifically, in the case of small businesses, the importance of the role of top management and the CEO has been verified by Thong (1999), in the case of the owner-CEO, who is often the top management for a small firm. Thong et al. (1996) provided an extensive list of references showing the positive relationship between top management support and IT assimilation.

H5: A higher level of top management support will lead to greater assimilation of social media technologies.

Institutional Pressures and Social Media Assimilation

According to DiMaggio and Powell (1983), mimetic pressures force an organization to change and become more like others. According to Haveman (1993), such pressures are manifested through the success of organizations and their practices in the environment of which the firm is a part. A firm will economize on search and experimentation costs by adopting solutions that are presumably working in other firms (Lieberman & Montgomery, 1988). Liang et al. (2007) established the role of mimetic pressures in ERP assimilation. Teo et al. (2003) showed that mimetic pressures promote the assimilation of financial electronic data interchange.

H6-A: A higher level of mimetic pressure will lead to greater assimilation of social media technologies.

Normative pressures work through relational channels among members of a network (DiMaggio & Powell, 1983). These pressures are exerted through channels between a firm and its suppliers and between a firm and its customers (Burt, 1982). They are also communicated through professional, trade, and other business channels. Wide use of a business practice serves as an indicator that the practice is valuable, and it tends to quickly become a norm in the institutional network. Liang et al. (2007) showed that normative pressures work through top management in ERP assimilation. Teo et al. (2003) observed that normative pressures work to assist in the assimilation of financial electronic data interchange.

H6-B: A higher level of normative pressure will lead to greater assimilation of social media technologies.

Firms can be subject to coercive pressures from their customers, from their parent companies, and from government and regulatory bodies (DiMaggio & Powell, 1983). A dominant organization that controls scarce resources may demand that dependent firms adopt business practices that are to its benefit and not to the firms' benefit (Pfeffer & Salancik, 1978). Liang et

al. (2007) established that coercive pressures work through top management in ERP assimilation. Teo et al. (2003) observed that coercive pressures work to assist in the assimilation of financial electronic data interchange.

> H6-C: A higher level of coercive pressure will lead to greater assimilation of social media technologies.

Research Methodology

In this section, we describe the motivation and sources for our dependent, mediating, and independent variables. The measures, variables, and sources are shown in Appendix B.

Dependent Construct

This research is focused on the assimilation of three related types of information systems, all related to social media in an organization. Our interest is in the whole organizational assimilation life cycle, and our measure was developed using suggestions from Rogers (2005) and Fichman (2001). Studies have shown that firms are increasingly assimilating social media technologies, especially blogs, wikis and social networking technologies (Bughin and Chui, 2013). The assimilation stage of technology is aggregated over the social media technologies of blogs, wikis, LinkedIn and Facebook. Rogers (2005) described the adoption life cycle process as an innovation-decision process having five steps: knowledge, persuasion, decision, implementation, and confirmation. For IT software systems, Fichman (2001) listed six assimilation stages: not aware, aware, interest, evaluation/ trial, commitment, limited deployment, and general deployment. A similar scale was adopted for this research, including the following stages: no current activity; aware; interested; evaluated; committed; limited installation; general installation; acquired, evaluated, and rejected; and do not know/other. This technology cluster adoption and assimilation model maps to the theory of Rogers (2005); however, the research model employs a more granular scale by mapping "no current activity" and "aware" to Rogers's knowledge phase, in addition to "interest," "evaluation," "commitment," "limited deployment," and "general deployment."

Independent Constructs —Mimetic, Normative, and Coercive Pressures

These constructs were borrowed from Teo et al. (2003), Liang et al. (2007), and Rui et al. (2011). These are all first-order formative constructs.

Mediating Constructs —Absorptive Capacity and Top Management Support

We developed our own formative scale based on items from the literature. Our items are based on both the stock and process views of absorptive capacity (Roberts et al., 2012). Two items were chosen from each view so that both the views were equally represented. Prior related knowledge is essential for a firm to accurately determine the potential value of external knowledge to absorb (Roberts et al., 2012). To measure stock of related technology, we chose the

firm's previous assimilation of Lotus Notes and web services as both are related information technologies. Prior to the advent of social media technologies, Lotus Notes allowed employees in an organization to exchange user generated content, a key aspect of social media technologies. Firms are employing various web services, which usually are multiple small applications that allow exchange of messages, documents, schedules, videos and other user created content (Recine et. al., 2013). When understanding the role of social media in organizations prior studies have stressed (e.g. Kaplan and Haenlein, 2010) the relevance of studying a spectrum of technologies as compared to one specific website or application. To measure process, we adopted the items used by Ettlie and Pavlou (2006) because they were most closely associated with the notion of absorptive capacity that we are using in this research. Two items chosen from Ettlie and Pavlou (2006) correspond to the firm's ability to identify and integrate related knowledge from outside. For top management, we adopted the measure from Liang et al. (2007).

Control Variables

To date, there has been considerable research in the information systems field into the antecedents of technology adoption for large firms. In order to isolate the effects of social influences from the factors that are known to be heavily correlated with technology adoption, three control variables were chosen: firm size, size of the IT department, and firm age.

Firm Size: According to Rogers (2005), size is one of the most critical determinants of innovator profile. It has been well established in the innovation diffusion literature that firm size is often a proxy for resource slack and infrastructure, which promote innovativeness (Mohr & Morse, 1977; Utterback, 1974).

IT Size: Similarly, IT size in terms of number of employees is taken as a measure of greater professionalism, more slack resources, and more specialization in the IT field (Fichman, 2001). More specialization and professionalism in turn lead to more sharing of ideas and a broader knowledge base that promotes innovation (Damanpour, 1991).

Firm Age: In line with the competitive view of firms, older firms in contrast to younger firms have shown the ability to survive (Thornhill & Amit, 2003). Younger firms generally lack knowledge of how to compete (Lippman & Rumelt, 1982), are not sufficiently endowed with resources (Lussier, 1995), and are subject to higher mortality rates (Thornhill & Amit, 2003).

Table 1: Sample Demographics					
Characteristics	**Frequency**	**Percentage**	**Client Management Experience (Year)**	**Frequency**	**Percentage**
Client Position in Organization			0-5	220	73.3
Chief Executive/Senior Manager	5	1.7	6-10	39	13.0
IT Manager	50	16.7	10+	41	13.7
Middle Manager	9	3.0	**Client Work Experience (Year)**		
Supervisor	16	5.3	0-10	114	38.0
IT Professional	214	71.3	11-20	96	32.0
Staff/Non-Managerial	6	2.0	21-30	68	22.7
Industry of Client Organization			30+	39	13.0
Manufacturing	29	9.7	**Size of Client Organization (Number of Employees)**		
Finance, banking, and insurance	51	17.0	0-500	142	47.3
Health care	41	13.7	501-5,000	57	19.0
Education	25	8.3	5,001-50,000	68	22.7
Government	18	6.0	50,000+	33	11.0
Professional and other services	39	13.0	**Size of IT Department in Client Organization (Number of Employees)**		
Information technology and telecommunications	86	28.7	0-50	151	50.3
Transportation and utilities	14	4.7	51-500	82	27.3
Retail and wholesale trade	25	8.3	501-5,000	48	16.0
Other	35	11.7	5,000+	19	6.3

Data Collection: Sample and Procedure

The unit of data collection in our research is a firm. The survey instrument was pre-tested with graduate students who were employed in the IT field. Content validity was assessed by several IS researchers located at one university. The data was collected by administering a web-based questionnaire. This was deemed appropriate, since the target respondents used the IT resources

of their organizations and had access to the Internet. The population selected for this study was information systems professionals and managers with knowledge of new social media information technologies.

A professional research company contacted participants that were employed in a diverse set of industries. Their US business panel consists of more than 1.25 million members. This data collection method has been used in academic research (e.g., Thau et al., 2008). The identities of participants were kept confidential by the research company. In return for their participation, respondents were given a points-based incentive redeemable for prizes. Statistics from the web server hosting the online survey showed that 725 individuals were interested in participating. Those panel members were asked screening questions about their suitability for the survey. The participants were not told that these questions served as exclusion criteria. If they passed the screening questions, they were invited to complete the survey. The final sample consisted of 300 respondents.

Table 1 provides sample demographics. The sample covered a broad range of industries. The organizations included small, medium, and large firms, mostly from the private sector. The respondents had extensive experience and significant education. Over 60% had more than 10 years of professional experience.

Data Analyses and Results

The measurement and the structural models were tested using structural equation modeling. The psychometric properties of the measurements were evaluated by the component-based partial least squares (PLS) approach with the Smart-PLS software package (version: 2.0.M3). The PLS approach is appropriate for our exploratory research and theory development because it focuses on prediction of data.

Assessment of Measurement Model

Reflective Constructs: We tested for reliability and convergent and discriminant validity. Table 2 shows the mean, median, and standard deviation for the indicators of both formative and reflective constructs. Formative constructs are treated differently from reflective constructs. We assessed the reliability of reflective constructs with Cronbach's alpha coefficient, composite reliability, and significance of item loading (see Tables 3 and 4). We have one reflective construct: top management. The construct achieved a score above the recommended value of 0.7 for Cronbach's alpha (Nunally & Bernstein, 1994) and composite reliability (Nunally & Bernstein, 1994) (see Table 4). The cross loadings are shown in Appendix A. The item loading for the reflective construct is significant at the 0.001 level (Table 3). This ensures the scale reliability and the internal consistency of the construct in our research model.

Table 2: Standardized Indicators, Means, & Weights				
Item	**Dimensions/Questions**	**Mean**	**Median**	**Std-dev**
SM1	What is the status of use and implementation of Blogs?	3.78	4	2.23
SM2	What is the status of use and implementation of Wikis?	3.79	4	2.40
SM3	What is the status of use and implementation of social media tools such as LinkedIn and Facebook?	4.09	4	2.24
Acap1	We are able to identify, value, and import external knowledge from our business partners.	5.07	5	1.24
Acap2	We can successfully integrate existing knowledge with new knowledge acquired from our business partners.	5.11	5	1.17
Acap3	What is the status of use and implementation of Lotus Notes?	2.51	2	2.24
Acap4	What is the status of use and implementation of Web services?	5.28	6	2.67
Cor1	We spend considerable time on meetings and telephone conversation with our important customers.	5.12	5	1.36
Cor2	We engage is open and honest communication with our customers.	5.51	6	1.20
Cor3	My firm must maintain good relationship with customers who are adopting new technologies.	5.54	6	1.20
Nor1	Our suppliers are adopting new technologies.	5.54	5	1.05
Nor2	Vendors' promotion of technology influences us to adopt them.	5.18	5	1.22
Nor3	We share the same vision of the industry as our competitors.	4.38	5	1.36
Mim1	Our main competitors are adopting new technologies.	5.03	5	1.23
Mim2	Competitors who are important to us think that new technologies are useful.	4.94	5	1.16
Mim3	Competitors whose opinions we value think new technologies are beneficial.	5.16	5	1.10
Mgm1	The senior management of our firm actively articulates a vision for the organizational use of new technologies.	4.89	5	1.54
Mgm2	The senior management of our firm actively formulated a strategy for the organizational use of new technologies.	4.81	5	1.51
Siz*	What is the total number of people (full time equivalents) employed in your firm?	21994	59400	900
ITSiz*	What is the total number of people (full time equivalents) employed in your information systems department in your firm?	3206	53	1519
Age*	What is the age of your firm in years?	51.85	30	53

*Control Variable

Table 3: Psychometric Properties of Formative and Reflective Constructs			
Formative Constructs			
	Item	**Item Weight/ t-values**	**VIF**
SM_Assm	SM1	0.36/2.83**	1.36
	SM2	0.38/4.59***	1.27
	SM3	0.5/3.63***	1.18
Abs_Cap	Acap1	0.23/2.12*	1.81
	Acap2	0.42/3.74***	1.78
	Acap3	0.30/4.00***	1.02
	Acap4	0.58/5.49***	1.07
Mimetic	Mim1	0.19/.90	2.63
	Mim2	0.20/.93	2.89
	Mim3	0.67/4.14***	2.64
Normative	Nor1	0.63/5.40***	1.51
	Nor2	0.29/2.09*	1.57
	Nor3	0.29/2.34*	1.22
Coercive	Cor1	0.44/4.17***	1.41
	Cor2	0.53/3.73***	1.50
	Cor3	0.24/1.39	1.75

Reflective Construct					
	Alpha*	**CR****	**AVE†**	**Item**	**Item Loading/t-values**
Top_Mgt	0.944	0.973	0.947	Mgm1	0.972/144***
				Mgm2	0.974/154***
*Cronbach; ** Composite Reliability; †Average Variance Extracted					
*** p < 0.001; **p< 0.01; *p<0.05					

For convergent validity of the reflective construct, we examined the factor loadings of the individual measure and the Average Variance Extracted (AVE) (see Table 3). The AVE value for the reflective construct was above the minimum recommended value of 0.50 (Fornell & Larcker, 1981). For discriminant validity, we have Table 4, which shows that the reflective construct of top management's AVE is much greater than its highest squared correlation with any other latent variable, thus ensuring discriminant validity.

Table 4: Correlations Among Major Constructs									
	Abs_Ca	Coer	Frm_A	IT_Sz	Mi	Nor	Sz	Top_Mgt	SM_Assm
Abs_Cap	N/A[†]								
Coer	0.41	N/A[†]							
Frm_Ag	0.00	0.02	N/A[‡]						
IT_Sz	0.09	0.13	0.43	N/A[‡]					
Mim	0.39	0.45	0.10	0.10	N/A[†]				
Norm	0.32	0.41	0.01	0.00	0.64	N/A[†]			
Sz	0.15	0.16	0.16	0.61	0.12	0.01	N/A[‡]		
Top_Mgt	0.31	0.37	0.06	0.09	0.36	0.42	0.17	0.99	
SM_Assm	0.50	0.24	0.11	0.16	0.24	0.16	0.21	0.23	N/A[†]

Formative Constructs: The formative measurement model is assessed differently. The validity of formative constructs is assessed at two levels: the indicator level and the construct level. The indicator validity is assessed by indicator weights being significant at the 0.05 level (Chin, 1998) and also by the variance inflation factors (VIF) being below 10 (Gujarati, 2003). Except for two items for mimetic and one item for coercive, the items met these requirements of indicator significance and VIF values. Henseler et al. (2009) strongly recommended that items in formative constructs should not be deleted as long as they are conceptually justified, so we retained all the items in our model.

Validity at the construct level in terms of inter-construct correlations is assessed by having the correlations be less than 0.7, which is the case (Table 4) (Henseler et al., 2009). At the construct level, nomological validity is ensured by having a relationship among formative constructs as justified in terms of prior literature, which is also the case here (Henseler et al., 2009).

Our application of the Harmon one-factor test prescribed by Podsakoff and Organ (1986) resulted in six extracted factors from the survey data. Data relating to five formative constructs and one reflective construct were used for factor analysis. The highest variance captured was 33.32%. Thus, no single factor accounts for the bulk of the covariance, leading to the conclusion that common method bias is not an issue.
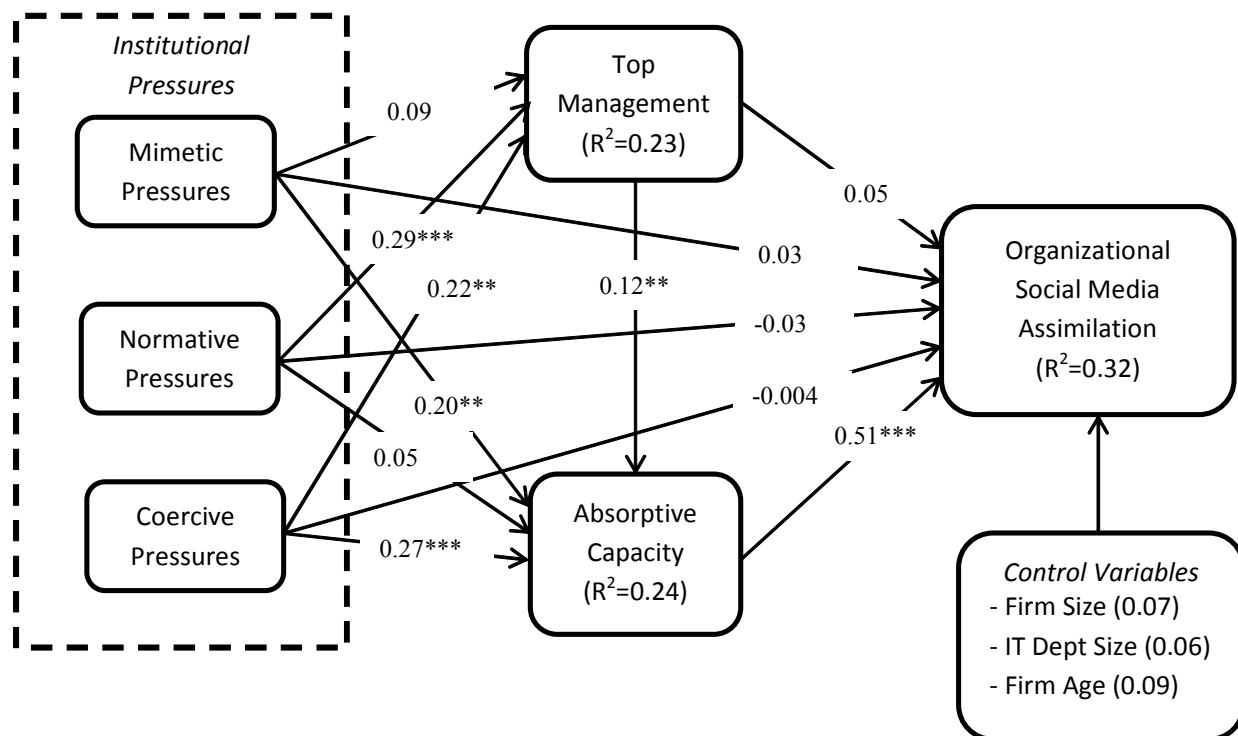
Figure 2: Results of the Structural Model Testing

Assessment of Structural Model

The structural model was analyzed in three steps. First, the R-square of each of the endogenous latent variables was determined along with the most essential criteria. Chin (1988) considers R-square values of 0.19 and below to be weak and greater values to be medium or substantial. Second, path coefficients were evaluated. The path coefficients needed to be significant at the 0.05 level and the path weights to be more than 0.10 (Urbach & Ahlemann, 1975). The mediation roles of top management and absorptive capacity were investigated. Finally, the non-parametric Stone-Geisser test was used to measure the predictive relevance of the model. Positive Q-square values confirmed the model's predictive relevance (Urbach & Ahlemann, 1975).

Table 5: Results of the Structural Model			
	Mean	**Standard Error**	**T Statistics/P value**
Abs_Cap -> SM_Assm	0.51	0.06192	8.18***
Coer -> Abs_Cap	0.27	0.07743	3.26***
Coer -> Top_Mgt	0.22	0.07103	3.03**
Coer -> SM_Assm	-0.004	0.0651	0.09
Frm_Ag -> SM_Assm	0.09	0.05033	1.68*
ITSz -> SM_Assm	0.06	0.0568	0.94
Mim -> Abs_Cap	0.20	0.07316	2.75**
Mim -> Top_Mgt	0.09	0.10407	0.80
Mim -> SM_Assm	0.03	0.06651	0.50
Norm -> Abs_Cap	0.05	0.06826	0.54
Norm -> Top_Mgt	0.29	0.0822	3.46**
Norm -> SM_Assm	-0.03	0.08392	0.54
Sz -> SM_Assm	0.07	0.06151	1.10
Top_Mgt -> Abs_Cap	0.12	0.06442	2.03*
Top_Mgt -> SM_Assm	0.05	0.05866	0.95

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

The summary of the PLS analysis is presented in Figure 2 and Table 5. Following Teo et al. (2003), we estimated two models with and without the three control variables. The presence of control variables contributed little to the R-square values of endogenous values. Their paths were statistically insignificant with low weights (Figure 2), so no further discussion is required for control variables. For the model in Figure 2, the R-square value of 0.32 for social media assimilation was substantial, as were the R-square values of the endogenous latent variables of top management support and firm absorptive capacity (0.23 and 0.24 respectively). The significant R-square values obtained here provide evidence for the mediating roles played by the two latent variables: top management and absorptive capacity. As shown in Figure 2, the links between top management and absorptive capacity and between absorptive capacity and social media assimilation were significant at the 0.01 level with path weights in excess of 0.1, thus offering evidence for the mediation hypotheses 3 and 4.

Figure 2 also shows that the links between mimetic pressure and coercive pressure on absorptive capacity were significant, but not the one between normative pressure and absorptive capacity; thus hypotheses 1A and 1C are supported but not 1B. Furthermore, the links between normative

and coercive pressure and top management were significant, but not the link between mimetic pressure and top management, thus providing evidence for hypotheses 2B and 2C but not 2A. The path weights and significance provide no evidence for the direct effects of mimetic, normative, and coercive pressures on social media assimilation and hence no evidence for hypotheses 6A, 6B, and 6C. However, the effects of mimetic, normative, and coercive pressures are mediated by the absorptive capacity of a firm, and that is shown below.

Mediation Analysis of Absorptive Capacity: We tested the mediating role of absorptive capacity in the relationship between institutional pressures and social media assimilation. We used a second-order formative construct made out of three institutional pressures: mimetic, coercive, and normative. We assessed the direct effects of this second-order institutional pressure construct on absorptive capacity and social media assimilation, which were significant at the 0.01 level. In addition, we performed Sobel, Aroian, and Goodman mediation tests (Table 6A), and their test statistics were all significant. Thus, the mediation role of absorptive capacity is validated. As the t-value of the direct effect is insignificant, the mediation effect is full.

Table 6A: Tests for the Mediating Role of Absorptive Capacity				
Construct Mediated by Absorptive Capacity	**Sobel Test**	**Aroian Test**	**Goodman Test**	**Result**
Institutional Pressures→Social Media Assimilation	5.91	5.89	5.93	Mediation Supported

Mediation Analysis of Top Management: We tested the mediating role of absorptive capacity in the relationship between top management support and social media assimilation. We assessed the direct effects of top management on absorptive capacity and social media assimilation, which were significant at the 0.01 level. In addition, we performed Sobel, Aroian, and Goodman mediation tests (Table 6B), and their test statistics were all significant. Thus, the mediation role of absorptive capacity is validated.

Table 6B: Tests for the Mediating Role of Absorptive Capacity				
Construct Mediated by Absorptive Capacity	**Sobel Test**	**Aroian Test**	**Goodman Test**	**Result**
Top Management→Social Media Assimilation	4.06	4.04	4.07	Mediation Supported

Predictive Relevance: The predictive relevance of the structural model was evaluated using the Stone and Geiser Q^2 test for cv-redundancy measure, which estimates the capacity of the model to predict manifest variables. The blindfolding test with omission distance equal to 7 showed that

Q^2 values were all greater than zero (Top_Mgmt: 0.941, Abs_Cap: 0.257, and SM_Assm: 0.457). Positive Q values provide evidence of the model having achieved predictive relevance, which is the case here.

Discussion

As shown in the assessment of the structural model, the study confirms that institutional pressures influence social media assimilation, but only indirectly. The role of top management in mediating this influence was also confirmed. The assimilation of social media works through general learning or absorptive capacity of the firm, the other important hypothesis in the paper.

There are interesting parallels and differences with two other papers in the literature that used institutional theory in IT assimilation research. Teo et al. (2003) found all three types of institutional pressure—mimetic, normative, and coercive—significant, with mimetic having a very weak path weight. Liang et al. (2007) found mimetic and normative pressures to be most significant. In contrast, there was no evidence of a direct effect of institutional pressure on social media assimilation in our study. This study found mimetic and coercive pressures to be most significant, and importantly, indicates that their influence is completely mediated via top management and absorptive capacity. Similarly, while Liang et al. (2007) found the direct impact of top management to be strong, there was no evidence for this in our paper.

The differences in outcomes may well be due to the difference in the nature of the technology studied, particularly the participatory nature of the technology studied in this paper. Teo et al. (2003) examined inter-organizational linkages and Liang et al. (2007) examined ERP. Social media is a not a mission-critical technology like ERP and generally is not implemented on the orders of top executives. In most places, it grows organically in a bottom-up fashion through initiatives taken by younger and more digitally savvy members of the management community. In our study, mimetic forces are due to the tendency of firms to copy their competitors, coercive pressures are due to influence exerted by customers, and normative pressures are through vendors selling new technologies as the norm. Because vendors have little role to play in the assimilation of social media such as blogs, wikis, and Facebook, the normative effect was found to be weak. Moreover, extensive use of social media is still not the norm in most industries.

Theoretical Contribution

Our study contributes to both IT assimilation and firm innovation literature. Within the assimilation literature, it is one of the few papers that addresses the issues at the organizational and firm environment level (Rogers, 2005). This, to our knowledge, is the first paper to test the linkage between institutional pressures and social media assimilation in organizations. In terms of theoretical contribution, it extends the work of Teo et al. (2003), Liang et al. (2007) and Saraf et al. (2012) by investigating how the absorptive capacity of a firm acts as a mediating factor between institutional pressures and IT assimilation. The study found that absorptive capacity is a critical factor in this network of relationships that connect institutional pressures and social

media assimilation. This is one of the first studies to use a composite view of absorptive capacity that includes both past experiences with similar technology and general ability to learn and integrate new knowledge.

In the field of innovation literature, the study found evidence that institutional pressures such as mimetic and coercive pressures act to enhance the absorptive capacity of a firm. The concept of absorptive capacity is increasingly playing an important role in IT innovation (Roberts et al., 2011), and finding antecedents to this construct is an important contribution of the paper. This study extends the current firm-level IT assimilation models in use.

Managerial Implications

Our study offers several guidelines for management. The study finds that institutional pressures coming from customers, vendors, and competitors impact social media assimilation. It also confirms the role of top management in this process. If top management championed the use of social media among its employees, it could be productive. According to the study, absorptive capacity is a key element in promoting social media. Assimilation of wikis, web services, and LinkedIn in an organization is influenced by the organization's ability to integrate existing technologies with new technologies, which is a measure of its absorptive capacity. Firms should therefore encourage and provide incentives to employees for experimentation with new technologies. They should encourage employees to spend time in learning activities such as scanning sources of information, evaluating them, and incorporating them into their routines. Top management should encourage employees to be open to their customers and use as many social media channels of communication as possible, enabling multiple points of contact. Normative effects can be harnessed when management members come to view social media usage as the norm; that view may be promoted through exposure to social media usage by firms that have been leaders in this space, such as Dell and Cisco.

Limitations and Future Research Directions

There are several limitations to this research, many of which are inherent in the model. Without a longitudinal study, it is not possible to establish temporal and recursive relationships between institutional pressures and IT assimilation, although they are likely to be there. It is likely that there are other variables that are in play but were not accounted for in this model. Future research needs to focus on these issues.

Our analysis is on a firm level with only a single respondent from each firm. This may not be adequate to capture all the perception items that are relevant to the whole firm. However, this is common in IT assimilation research. In the study by Teo et al. (2003), out of 222 responses from firms, they had 124 firms with only single responses. Liang et al. (2007) found something similar: in all 77 of their surveys, each firm was represented by a single individual, quite often a CFO or mid-level finance department executive (see Liang et al., 2007, p. 69).

Our model is driven by both the institutional and learning perspectives. Our model investigates how institutional pressures and top management influence absorptive capacity and thereby social media assimilation. However, absorptive capacity is a heavily researched topic in literature, and the next step of research could be an investigation of how top management and institutional effects interact with the constituent items that make up the absorptive capacity construct. Besides the absorptive capacity of a firm, which is a large aggregate concept, IT-focused competencies could be a more appropriate factor to examine. Existing literature on the role of IT platforms and associated competencies can be researched for possible use in research on social media assimilation (Sambamurthy et al., 2003). Another useful area may be investigating the roles of different communication channels in bringing the influence of institutional pressures to bear on the firm. These channels would include mass media, social media, industry associations, and trade shows and exhibitions.

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	Abs_Cap	Coer	Frm_Ag	ITSz	Mim	Norm	Sz	Top_Mgt	SM_Assm
Appendix A: Cross Loadings									
Acap1	**0.634**	0.382	0.012	0.023	0.395	0.334	0.150	0.306	0.191
Acap2	**0.689**	0.472	-0.036	0.011	0.402	0.311	0.083	0.287	0.206
Acap3	**0.631**	0.056	-0.063	0.125	0.095	0.149	0.042	0.148	0.312
Acap4	**0.746**	0.187	0.071	0.086	0.177	0.132	0.112	0.139	0.530
SM1	0.347	0.178	0.095	0.077	0.198	0.129	0.123	0.147	**0.809**
SM2	0.385	0.172	0.066	0.192	0.212	0.203	0.210	0.204	**0.742**
SM3	0.367	0.184	0.082	0.115	0.133	0.043	0.144	0.183	**0.700**
Cor1	0.343	**0.789**	-0.036	0.168	0.341	0.293	0.203	0.276	0.182
Cor2	0.329	**0.854**	0.010	0.064	0.379	0.354	0.089	0.344	0.197
Cor3	0.329	**0.775**	-0.037	0.091	0.430	0.408	0.108	0.267	0.198
Frm_Ag	0.009	-0.019	**1.000**	0.043	0.103	-0.001	0.162	0.058	0.110
IT_Sz	0.099	0.131	0.043	**1.000**	0.101	-0.007	0.608	0.094	0.157
Mgm1	0.312	0.354	0.058	0.075	0.346	0.399	0.191	**0.973**	0.242
Mgm2	0.302	0.373	0.054	0.109	0.363	0.435	0.157	**0.973**	0.202
Mim1	0.312	0.450	0.039	0.078	**0.831**	0.609	0.102	0.306	0.216
Mim2	0.356	0.381	0.079	0.091	**0.858**	0.578	0.081	0.282	0.218
Mim3	0.377	0.435	0.115	0.099	**0.976**	0.594	0.117	0.364	0.228
Nor1	0.286	0.367	0.021	0.026	0.571	**0.912**	0.050	0.391	0.174
Nor2	0.246	0.343	-0.062	-0.035	0.458	**0.772**	-0.030	0.352	0.085
Nor3	0.246	0.282	0.010	-0.044	0.466	**0.638**	-0.072	0.252	0.087
Sz	0.146	0.165	0.162	0.608	0.116	0.002	**1.000**	0.178	0.201

Appendix B: Measures, Variables, and Their Sources

Latent Variables	Individual Measures	Variable Description	References
Independent variables INSTITUTIONAL PRESSURES	Mimetic	3-item formative construct	Liang et al. (2007), Teo et al. (2002)
	Normative	3-item formative construct	Chen et al. (2012), Liang et al. (2007)
	Coercive	3-item formative construct	Teo et al. (2002)
Control variables	Firm size, IT size, and age	Actual size of the firm and the size of the IT department in terms of employee #	Fichman (2001), Liang et al. (2007)
Mediating variable Top Management Support	Top management	2-item reflective construct	Liang et al. (2007)
Mediating variable Absorptive capacity	Absorptive capacity	4-item formative construct	Fichman (2001), Ettlie & Pavlou (2006)
Dependent variable SOFTWARE ASSIMILATION	Assimilation of social media technologies	4-item formative construct, each using Guttman scale	Fichman (2001), Rogers (2005)