SOCIO-TECHNICAL FACTORS INFLUENCING SOCIAL MEDIA ADOPTION IN BUSINESS
A Semiotic Perspective

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Abstract: Web 2.0 technologies, commonly referred to as social media (SM), have become important tools within the growth of information and communication technology (ICT) in the last few years. SM tools such as blogs, wiki and other services which are widely used by individuals also have an effect on business activities. SM tools can change the mode and intensity, at which a business connects, collaborates, cooperates and communicates. However, SM tools have not yet to be fully utilised as value-adding tools in improving business relationships. Different scholars have proposed various socio-technical approaches to study organisations and information systems (IS) analysis, modelling and implementation. This paper identifies the social and technical factors that influence SM adoption in a business environment. The Organisational Semiotics (OS) approach, specifically the 'organisational onion' model and the semiotic framework, has been used to understand and analyse SM at different abstraction levels and through a scoping study.

1 INTRODUCTION

Social media (SM) tools are a paradigm shift in the way the Internet is used to provide bi-directional communication. They involve a more open approach to the Internet and to user-generated content in particular. They also offer numerous links to other websites and sources of information enabling people to gather information, collaborate with each other and build relationships. However, despite the transformation these online tools could provide, there is a slow rate of adoption of Web 2.0 technologies by businesses (Newman and Thomas, 2009). This slow rate of adoption is due to several reasons: policies and procedures that inhibit change, privacy and security issues, and organisational culture being directly opposed to the open source and collaborative methods utilised in Web 2.0 (Newman and Thomas, 2009). In addition, organisations still fail to realise their potential benefits in developing a sustainable competitive advantage (Newman and Thomas, 2009).

On the other hand, large organisations such as Wells Fargo and General Motors have used SM not only to build strong relationships with customers and prospects, but also to increase employee productivity and collaboration (Young et al., 2008). As a result of SM popularity, organisations noted the power of these technologies and the considerable customer involvement and attention (Chui et al., 2009). Consequently, practicing and installing these tools internally for a test period becomes a part of firms' activities (Chui et al., 2009) to offer more user-centric and effective services (Ala-Mutka et al., 2009).

Generally, SM tools are found to play a substantial role in building relationships and collaboration not only among individuals but also businesses. The investment in SM tools is estimated to account for $4.6 billion in 2013 (Young et al., 2008). In addition, Web 2.0 adoption was considered as a priority in 2008 for 56 percent of North American and European companies (Young et al., 2008). The question is what approaches or methods one should use to implement these new technologies effectively. As SM tools focus on people rather than products, it is essential to find a tool that bridges the gap between technology and the social factors that influence the adoption. One way is to investigate SM by using the organisational semiotics (OS) approach. This approach focuses on sign systems that are useful for examining and understanding issues faced by organisations.

This paper aims to identify socio-technical factors that affect the adoption of SM tools in business. Despite the impressive popularity of the SM among individuals, its use in business still appears immature. Because of limited concrete scientific studies and the absence of the business models for SM adoption, this paper takes an analytical approach to characterise the socio-technical factors.

2 BACKGROUND

2.1 Social Media (SM) and Web Technologies

SM and Web 2.0 are two terms (often used interchangeably) which refer to highly interactive technologies that emphasise human interaction, collaboration and connectivity (Burns, 2008). Blogs, microblogging, wikis, podcasts, social networking websites, video and RSS feeds are the most common types of SM. The term Web 2.0 was introduced in 2005 by O'Reilly who defined it as "a network as platform, spanning all connected devices" (O'Reilly, 2007, p. 17), which quickly evolved to "a set of economic, social and technology trend that collectively form the basis for next generation of the Internet – a more mature, distinctive medium characterised by user participation, openness and network effects."(Musser et al., 2006, p. 4) This change in definition shows the complexity and fluidity of Web 2.0, and explains why there is no clear definition of Web2.0.

Recently, the use of Web 2.0 technologies has grown rapidly (Newman and Thomas, 2009). Over the past few years, these SM technologies have spread widely among people (Chui et al., 2009) and have drawn more attention by practitioners and researchers. The main reason for this widespread attention could be that Web 2.0 has attracted millions of people who use it as their preferred communication channel. Figure 1 shows the global rise of social networking sites (SNS) from December 2007 to December 2008 (Nielsen_Online, 2009, P.2). According to this the SNS have attracted close to 67 percent of the total online global population, up from 61 percent the previous year.

SM tools also could have more far-reaching effects on firms than technologies that were implemented in the 1990s, such as enterprise resource planning (ERP), customer relationship management (CRM) and supply chain management (SCM) (Chui et al., 2009). The reasons for this can be due to the bottom-up involvement from frontline employees to senior executives, the contribution of a wide range of people, the requirement of different mind-set and the high degree of participation (Chui et al., 2009). Where most users of ERP or CRM systems are simply processing information or executing transactions, SM are bi-directional tools that give users or participants the ability to create new information and content or edit the work published by others (Chui et al., 2009).

SM are useful tools that have the potential to bring benefits to organisations. The main advantage of Web 2.0 is the linkage among people, ideas, processes, systems, contents and other organisational activities. In addition, as Web 2.0 offers services and not a product, people can contribute, and collaborate with others, share information and reuse Web content. These tools can be used internally amongst employees or externally with customers and suppliers, which could increase knowledge sharing, collaboration efforts and new innovations.
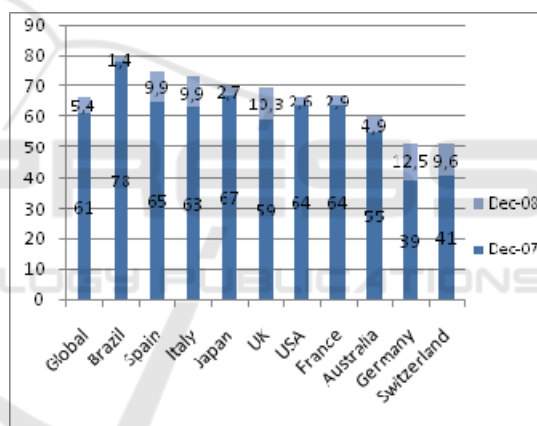

Figure 1: Percentage of rise in population for Social Networking sites of Total Online population (Adopted from (Nielsen_Online, 2009, P.2)).

A wide range of technologies are coming under the list of SM tools. The following are tools which are most common and potentially useful for business:

Blogs/Microblogging: Blogs are online journals (Mayfield, 2006) offering many different messages such as long essays, personal diaries or links to other websites. The various types of blogs include (Mayfield, 2006): 1) Personal Blogs 2) Political Blogs 3) Business Blogs and 4) Mainstream Media Blogs. Microblogging is a new type of real-time communication publishing that combines social networking with bite-sized blogging where messages are limited to less than 200 characters. Short contents are distributed online, by email, Instant

Messenger (IM) or over the mobile network (Java et al., 2007).

Social Bookmarking: Social bookmarking are services that allow users to classify online resources by using 'folksonomies' or keyword categorisations, to tag and share frequently used or interesting online resources. del.icio.us is a popular bookmarking site (Yanbe et al., 2007).

Social Networking Services (SNS): SNS are personal web pages that focus on building online communities and interacting with others in order to share information, interests and activities (Josef and Hermann, 2006). It is a new way to communicate and share information that is used regularly by millions of people. Popular social networking websites are MySpace, Facebook and LinkedIn.

Wikis: Wikis enable a group of people to co-author and interact by adding or editing articles online (Josef and Hermann, 2006). Wikipedia, a widely known online encyclopaedia, is perhaps the most famous example, edited by users globally (Ebersbach, 2008). It is a simple virtual collaboration platform (Ebersbach, 2008) and can be a source for information and knowledge.

All of these tools can be used within an organisation to support or replace their current communication, cooperation, collaboration and connections efforts. Each of the various types of SM tools should be matched to the medium that best suits a specific business purposes; however, there will be some overlapping (Cook, 2008). For instance, blogs can be used as a communication tool to spread information organisational wide and keeping track of projects; Social Bookmarking can encourage cooperation by allowing tagging and categorisation, which can be used to capture implicit knowledge and identify knowledge experts (Cook, 2008). For collaboration, wikis are the most commonly used for information collection and document creation by multiple authors. SNS can be used to connect geographically dispersed and cross-functional employees for purposes of team-based projects and knowledge transfer/sharing (Cook, 2008).

3 FACTORS INFLUENCING SOCIAL MEDIA ADOPTION

This section will discuss the factors that influence SM adoption in a business environment. First, approaches in organisational semiotics will be described, in particular the 'organisational onion'

model and the semiotic framework. This is followed by the exploration of factors based on the 'organisational onion' model. Finally, these factors are analysed using the semiotic framework.

3.1 Organisational Semiotics Approach

There are numerous approaches to business analysis and modelling. While some researchers classify business analysis and modelling based on process, behaviour and data, others apply four views: functional, behavioural, data and system architecture (Wieringa, 1996). However, semiotics perspective concentrates on the relations among the IT system, business process and organisation (Liu, 2000). It is an approach that focuses on signs and sign systems. Organisational semiotics (OS) applies semiotic concepts to the analysis and design of organisations and information systems (IS). It also offers a range of methods and frameworks to analyse and design firms (Liu, 2000). Here we introduce two concepts in OS, the 'organisational onion' model and the semiotic framework, which we apply later in our analyses.

The 'Organisational Onion' model: According to Liu (2000), an organisation can be recognised as an IS and can be modelled as a structure of three aspects: informal system, formal system and technical system. Culture, beliefs, values, habits and individual behaviour are determinants in the informal layer. The middle layer is the formal IS, which contains bureaucratic forms and rules guiding the individual action—"how work should be done"—which can replace meaning and intention in the informal system with codified systems. The technical layer is where information and communication technology (ICT) are used to automate some parts of the formal system, which in turn support the informal systems. This model forms what is often called an "organisational onion" (Stamper, 1992).

The Semiotic Framework: Also known as the Semiotic Ladder (SL), the Semiotic Framework provides a way to analyse IS based on six layers of semiotic analyses (Liu, 2000). The traditional semiotic layers of syntactic, semantics and pragmatic were extended by Ronald Stamper to include other three layers of social world, physical world and empirics (Liu, 2000). The semiotic framework characterises IS from two views: Human Information Functions (the top three layers of social world, pragmatics and semantics) and IT platform (the bottom three layers of syntactics, empirics and physical world).

Because OS offers a method to analyse IS in different levels, we believe that it is a useful method for investigating SM in a business environment. As SM contains some factors that can be found in the semiotic ladder, we use it to clarify some important issues related to SM adoption in different levels.

3.2 Analysis based on the 'Organisational Onion' Model

Here we attempt to identify the factors that influence the adoption of SM in a business environment from the three layers in modelling organisation as information systems: informal, formal and technical.

Informal Layer: Through SM, people's activities shifted from a static environment of writing documents via computer applications to a more dynamic environment: living life online, searching and sharing information, watching video on YouTube, buying and selling products through eBay, and building relationships using Facebook or LinkedIn.

Regardless of whether it is the evolution of SM that has changed user behaviour or the evolution of user behaviour that has caused the evolution of SM, customers and employees have come to embrace the culture of SM tools. Employees, as part of this society, have seen the benefits of using SM in their personal lives to communicate, cooperate, collaborate and connect with others. These same employees have begun to adopt these familiar SM into their work life (Cook, 2008). As the younger generation moves into the workforce they will increasingly expect to use the same participatory tools.

However, managers have some concerns because they believe by introducing SM into the workplace, productivity and profits will be lessened, as it will take the place of the "water cooler" and only encourage gossip and waste valuable employee time (Cook, 2008). Consequently, organisational culture can influence the adoption of SM (Newman and Thomas, 2009) because technology itself cannot change organisations' culture. In Web 2.0, information and knowledge are built and shared through social interaction. Therefore, for SM to be adopted, communication, cooperation, collaboration and connections with SM must be a norm, not expectations, as they are a key factor in Web 2.0 technologies usage.

If the use of SM is adopted as a norm in the informal layer, it provides the basis for it to be introduced into the formal layer as more employees adopt the technologies and demand to use them in

the workplace. Subsequently, organisations may see the benefits of interactions supported by SM in the business process.

Formal Layer: According to a McKinsey Global Survey (McKinsey&Company, 2008), the rate of organisation that were experimenting with SM between 2007 and 2008 has increased; approximately 60 percent of participants were satisfied with Web 2.0 initiatives and 87 percent of organisations were using them in customer relationship. An impact of SM can be highlighted in organisations across sectors. It can be used for improving internal work process, recruitment, product design and quality, and customer relationship (Ala-Mutka et al., 2009).

Because of the success of SM use in an informal environment, early adapters are using SM internally and externally for business purposes. Dresdner Kleinwort Wasserstein (DrKW), an investment bank, is an example of a company applying SM to internal business processes (Klobas and Beesley, 2006). At DrKW, the user-centred team started to use wikis to help with interaction among their 6,000 geographically dispersed employees. DrKW "adopted the wiki as a communication tool, a collective discussion tool, as a repository for documents and information and as a project management tool" (Klobas and Beesley, 2006, p 105).

For external outreach, some organisations are building online SNS websites for business innovation, engaging customers (Newman and Thomas, 2009) and outsourcing intelligence. This approach was proposed by Procter and Gamble who developed a program called "Connect-and-Develop". This program aims at connecting external sources like universities, government labs, web-based talent markets, and suppliers with the P&G innovation team in an effort to create new products which meet worldwide consumer performance and costs needs (Huston and Sakkab, 2006). Through this program, P&G produces over 35 percent of their innovations which saves billions of dollars in revenue (Huston and Sakkab, 2006).

However, there are some concerns regarding the published information such as type of information, information quality, information credibility, and reliability. As the organisation needs authentic, reliable information to make their decisions, a framework for information evaluating process has been developed to control this issue (Huston and Sakkab, 2006). Another concern is that many customers use SM to assess products and services delivered by companies Therefore, organisations

should be careful in maintaining their brand image through SM. In order to manage these concerns, organisations can create guidelines for SM usage by employees.

Although SM tools generate a medium for reaching out to customers, organisational change may occur or have to occur. According to Smith and Fingar (2003), there are many reasons why change in business process may occur, such as, business requirements, government regulations, environment, improved technology and resources. In particular, front-end processes such as transactional and operational processes of organisation may be affected by SM.

Technical Layer: The growing of social engagement results from the developing of Web 2.0 infrastructure and architectures and its ability of participation systems. Web 2.0 platform is built based on current protocols and computer languages in a unique way that generate a user-friendly application (Josef and Hermann, 2006) and encourage people to communicate and add value to their conversations (Newman and Thomas, 2009).

On the other hand, the demand for ICT connectivity such as broadband and mobile networks, software and hardware, by both organisations and individuals has increased (Ala-Mutka et al., 2009). This resulted from the rapid growth of SM users. In the US and Europe, more than 12 million customers accessed a social network site using their mobile in June 2007 (Bearne, 2007).

The technical layer has not fully evolved, as SM is currently only a set of tools to enable these interactions. There is potential for SM automation. Already there are integrations among technologies, for example automatically updating multiple platforms at the same time, e.g., TweetDeck. Another example is chatbox technology being used to integrate chat embedded into a website. However, there are some issues related to information security and privacy control (Dinev et al., 2009) due to the risk of misuse, viruses, hacking and stalking personal information.

3.3 The Semiotic Framework

In a business environment, a SM tool can be recognised as a sign that signifies the act of online interaction within organisation or with clients. Based on specific factors within business culture, this sign can be interpreted in different ways by different people. For instance, a customer may consider a presence of SM (a sign) on an organisation website as a communication tool; a salesperson may view it as a tool for building strong relationship with customers; a marketing person may think it is a way to understand customers' preferences; and a manager may consider it as wasting resources. Because of the different interpretations of the SM and its purpose, different views and behaviours are likely to exist.

The major concept behind the semiotics approach is the link among the multi-layers that represent the organisations or IS. It represents the mapping and rules of associations between the various layers. Here we attempt to analyse the adoption of SM in a business environment using the semiotic framework.

The physical world would comprise the data that are stored or generated in the SM (and the machines and servers that host SM—but this is outside our interest). The **empirics layer** is concerned with the network connections and communication protocols that enable the transmission of data linking interface devices of users. The **syntactic layer** focuses on the features of SM. For instance, microblogging enables users to interact in different forms such as text, IM, and RSS (Power and Forte, 2008). Wikis offer easy adding, editing, versioning capabilities (Ebersbach, 2008), and content discussions. However, SM may or may not be appropriate in terms of business functions and in some cases could be considered an ineffective tool in such a function.

The **semantics layer** focuses on the meanings, validity and truth. The semantics layer shows how the various areas within a business interpret the use of SM. For example, the sales department can use SNS as a customer relationship tool, Marketing can use sites such as Twitter and Facebook and chat to connect with customers and gain insight to customer preferences. Internally, employees can use SM, such as SNS to transfer knowledge amongst other employees. Additionally, a blog can be created for knowledge management and FAQ.

The **pragmatic layer** concentrates on what specific SM has been adopted for what specific purpose or objective. The purpose of adopting SM within an organisation can be innovation of new products, technologies and processes. A second purpose may be to provide familiarity, care, and sharing information with customers. This familiarity, caring behaviour and sharing information can are due to the increase of use in personal lives of customers and employees. In addition, being open with customers about products and innovations could help build trust with customers.

Human	Social World: Influences on Organisational Culture, Meaningful Relationship, Customer Loyalty and Commitment, Acceptance behaviour	
Information	Pragmatics: Intention of SM use in business, e.g., Business Objectives, Sharing information, Innovation, Familiarity, Caring Behaviour, Trust	
Functions	Semantics: Meanings associated with the use of various SM Tools, interpretation of the use of SM in Business, Familiar Interfaces, Information Collection, Knowledge Management/Sharing and Transfer	
The IT	Syntactic: Social Media Tool features, functionality, interfaces	
Platform	Empirics: ICT Infrastructure, Internet, Mobile networks	
	Physical World: Data, Web 2.0 Platform (Hardware) and Software	

Figure 2: The Semiotic framework and its links to the socio-technical factors that influence SM adoption.

In the **social world** layer, stakeholders including clients are influenced by the SM usage, such as creation and discussion of ideas, and gaining the sense of familiarity. This in turn contributes to building meaningful relationships, maintaining customer loyalty and commitment, and acceptance according to their social norms. If a company chooses a wrong medium to release their message it may be misinterpreted and change the users' perspective. For example, choosing blogs instead of email could influence the effect of the message contained, such as its seriousness. Figure 2 summarises how the factors that influence SM adoption relate to the semiotic framework.

3.4 Scoping Study

To obtain general information about the current situation of SM implementation in business, a small survey was conducted. Screening data was gathered from a group within a large international IT consulting firm. The responses came from people in the following roles: Technical Architecture, Solutions Architecture, Service development lead, Senior Executive (VP), Innovation Portfolio & Strategy manager and Enterprise Architect. The purpose of the questionnaire was to obtain a general picture about how knowledge-intensive firms are currently communicating with external and internal clients with a particular focus on the use of SM. A scoping study was carried out to collect preliminary data as to how firms are using SM. The questionnaire included general questions on what type of communication channels are being used for internal and external communication followed by other questions such as the benefits of using SM, and their concerns about using SM.

According to the respondents, the communication tool/method used the most frequently with external clients was email, followed

by face-to-face and telephone, then by Twitter. The tools/methods used internally on a continuous basis were face-to-face, email and telephone, followed closely by Chat, IM and Twitter. Blogs, wikis, and SNS were also used by some participants. It was also commonly stated that when used, SM met their communication expectations.

We also analysed the respondents' concern for each of three layers of the "organisational onion" model, Informal, Formal and Technical. In relation to the Informal layer, respondents state that using SM as internal communications tools have helped them meet their business objectives by improving communication and increasing productivity. Other respondents agreed that SM offered a way to transfer knowledge, increase innovation, and teambuilding. These responses can be associated to the Formal layer as they mention that although traditional communication channels are the norm the use of SM tools are increasing. However, accountability, lack of control and SM usage policies are concerns that were mentioned. In terms of the Technical layer, the tools used are internet and mobile technologies. It also revealed that security and privacy are the main issues when using SM. The analysis of the respondents' view is presented in Figure 3.
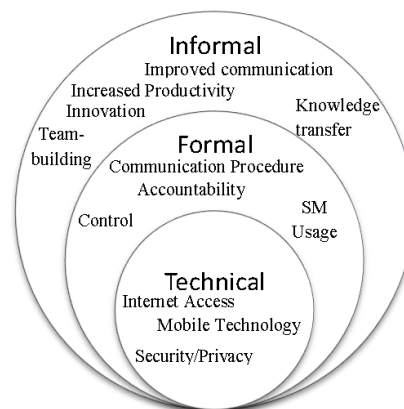

Figure 3: Respondents' concerns related to SM usage.

Table 1 presents the analysis of responses that address social, pragmatic, and semantic levels of the semiotic framework.

4 DISCUSSIONS

The socio-technical factors that contribute to adoption of SM by a firm are analysed. These factors can be considered as enablers or inhibiters to adopt SM. We found that while SM adoption within a business environment can produce the benefits of enhanced communication, collaboration, cooperation and connections that increase productivity and profit, factors such as business objectives, sharing information, innovation, familiarity, caring behaviour, and trust can influence its use. Some of these views are supported by the scoping study mentioned earlier (see Figure 3).

The Semiotics framework demonstrates that there should be a focus on the social interactions level when analysing SM tools. This is due to the fact that SM is more about human rather than technological aspects. In addition, the syntactic level of IT platform also requires attention because it is essential to choose an appropriate medium that suits both business and user needs, in order to gain organisational wide acceptance and usability.

The analysis of business users' concerns based on the scoping study provided an insight into how SM is expected to affect organisational activities. Although SM essentially a communication tool, a further analysis based on *organisational morphology* involving substantitive, communication, and control activities in organizations (Stamper et al., 1994) would enable us to understand the ways in which SM is used in firms.

5 CONCLUSIONS

The aim of this paper was to identify the socio-technical factors that influence the SM adoption in business using a semiotic approach. The "organisational onion" model and the semiotics ladder provide a framework of analysis for these factors. Based on the analysis, SM tools show considerable opportunities as well as risk for business. SM can benefit the internal and external process, such as knowledge management, business innovation, engaging customers, and outsourcing intelligence. Thus, engaging with SM and understanding how to cope with these tools can be

seen to open opportunities for a more effective business strategy. The current analysis will aid system designers in designing systems that integrate SM with traditional systems in a way that meets employee and customer preferences. This could lead not only to better understanding of customer needs and requirements but also to a successful adoption. The scoping study provides insight about using SM in a business environment. However, in order to validate the findings of this paper, semi-structured interviews with organisations and customers are ongoing. The focus of these explorations is to discover current and potential use of SM in terms of communication and collaboration. Future work will include a more research into the effects of SM within a business environment, the use of SM with various business areas, such as customer relationship management (CRM) and business process management (BPM).

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