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Measuring the Impact of Organizational Social WebSite Usage on Work Performance: A MultilevelModel

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Abstract
This paper describes the development of a multilevel model for investigating the impact of organizational social web site (SWS) usage on individual and team performance. Despite the SWS focus on collective phenomena - such as crowd sourcing and collective intelligence - previous research on SWS usage in general does not investigate it as a multilevel phenomenon. Our paper addresses this gap by drawing on existing guidelines for multilevel theorizing. We thus propose that SWS usage impacts individual and team performance through its improved collaboration capabilities. Organizational learning and social capital theories serve as the theoretical foundation. Ultimately, we present a multilevel model as the foundation for future empirical research on SWS usage's impact on individual and team performance. Our research's contribution lies in the theoretical derivation of a multilevel model.

Keywords: Social software, Web 2.0, Multilevel model, Performance, Organizational learning, Exploitation, Technology use

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Abstract

This paper describes the development of a multilevel model for investigating the impact of organizational social web site (SWS) usage on individual and team performance. Despite the SWS focus on collective phenomena – such as crowd sourcing and collective intelligence – previous research on SWS usage in general does not investigate it as a multilevel phenomenon. Our paper addresses this gap by drawing on existing guidelines for multilevel theorizing. We thus propose that SWS usage impacts individual and team performance through its improved collaboration capabilities. Organizational learning, social capital, and network theories serve as the theoretical foundation. Ultimately, we present a multilevel model as the foundation for future empirical research on SWS usage's impact on individual and team performance. Our research's contribution lies in the theoretical derivation of a multilevel model.

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Introduction

In an era of network-based organizations and multiteam systems (Marks et al. 2005), teams increasingly need to complete complex cross-functional tasks demanding intensive communication and collaboration to create and exchange valuable sources of knowledge and know-how (Ancona 1990). In order to meet such demands, employees are bound to tap into knowledge pools of other individuals, work teams, and organizations (Bock et al. 2005). Knowledge sharing is therefore increasingly recognized as a crucial source of competitive advantage (Eisenhardt and Santos 2002). Recent research endeavors have shown that knowledge sharing improves not only organizational idea development and innovation, but also work performance (Cummings 2004; Marrone et al. 2007). Consequently, many organizations employ information technology (IT) to support knowledge sharing and transfer (Kane and Alavi 2007). However, whether current IT sufficiently promotes knowledge sharing and transfer to enhance individual, team, and organizational performance has been a debatable point (Alavi and Leidner 2001).

Social web sites (SWS) – web sites providing social networking functionality and user-generated content – have recently attracted organizations' attention as they promise to strengthen knowledge sharing and knowledge transfer capabilities (Andriole 2010; Majchrzak et al. 2006; Wagner and Majchrzak 2006). Majchrzak et al. (2009, p. 103) summarize that "the value of social networking stems from the principles inherent in what has been referred to as *mass collaboration* or the *collective wisdom of the crowds.*" Despite the focus on collective usage or communities, recent work in the area of SWS investigates one unit of analysis at a time (e.g., Cummings et al. 2009; Ma et al. 2006; Shin and Kim 2008; Wattal et al. 2010). However, the

micro or macro-only perspective of research omits influences across levels (Yu et al. 2010). Therefore, only one part of the picture is covered by, for example, investigating individual SWS usage without including higher level phenomena's effects. Consequently, these studies may potentially overlook "the interrelationships among individuals, structures, institutions, etc., all of which may play a role in shaping the behaviors, actions, and outcomes" (Sarker and Valacich 2010, p. 780). Thus, "studying organizations one level at a time will ultimately lead to an unnatural, incomplete, and very disjointed view of how information systems (IS) are used in practice" (Burton-Jones and Gallivan 2007, p. 657). In our research, we draw on existing guidelines for multilevel theorizing (e.g., Klein and Kozlowski 2000a; Klein et al. 1994; Morgeson and Hofmann 1999) to gain further insights into multilevel effects by conceptualizing a multilevel model for investigating SWS usage's performance impact on individuals and teams.

We contribute to the IS literature in two ways. First, we conceptualize a multilevel model for SWS usage based on existing studies, as well as on guidelines for multilevel theorizing. Second, we propose a conceptual model providing insights into how SWS usage impacts performance in organizations. Our paper is organized as follows: The next section defines SWS, characterizes its organizational usage, and describes the theoretical foundations. We also acknowledge past usage research's achievements and outline the main criticism thereof. In the main section, we introduce the multilevel model and deduce our hypotheses. The conclusion summarizes the results and outlines the implications for research and practice, as well as the limitations and required next steps.

Theoretical Foundations

Social Web Site Usage

Social web sites (SWS) are "those Web sites that make it possible for people to form online communities, and share user-created contents (UCCs)" (Kim et al. 2009, p. 216). In the organizational context, people are represented by an organization's employees, a network of co-workers represents the community, and UCCs are represented by any kind of content, for example, text, photos, videos, bookmarks, user profiles, and activity updates. In short, organizational SWS are a mix of social networking sites, which consist of personal profiles and communities, and social media sites with which to share various media types (Kim et al. 2009). Organizations employ SWS to address knowledge bottlenecks (Wagner 2006) and to allow conversational ad hoc knowledge management (Wagner 2004; Wagner and Bolloju 2005). SWS thus offer the ability to discover user communities and their associated knowledge "germane to a user's current context" (Raghavan 2002, p. 94).

SWS usage is mainly concerned with collaboration and communication among individuals and teams (Majchrzak et al. 2009). However, the variety of tasks that employees use SWS for is broad. Typical tasks include (but are not limited to) finding experts, solving problems collaboratively, exchanging new knowledge and ideas, fine-tuning existing knowledge, reusing existing knowledge. sharing team information, coordinating project-related activities, empowering communities of experts, and helping people to establish and strengthen personal relationships (Drakos et al. 2010). Research on collaboration technology has shown that an individual's usage patterns are strongly influenced by her/his peer network's usage patterns (Sykes et al. 2009). With regard to organizational SWS usage, this means its effects at higher

levels need to be taken into account regarding its usage at lower levels. Disregarding such cross-level effects and applying strictly single level designs might lead to misleading conclusions (Burton-Jones and Gallivan 2007). To date, research in the area of SWS has offered insights into various phenomena. Wattal et al. (2010), for instance, operationalize weblog usage by individual employees' number of posts. Cummings et al. (2009) discuss two types of personal usage, namely consumption and contribution, by considering the individual as the unit of analysis. Shin and Kim (2008) argue that individual cognitions and effects determine a specific online SWS platform's usage, while also disregarding collective phenomena. Hence, we observe that despite being described as a collective phenomenon, SWS usage has mainly been investigated from the individual's perspective. In order to obtain insights into the collectivist SWS character, we draw on organizational learning (OL) theory (March 1991), social capital theories (Nahapiet and Ghoshal 1998), and social networking theories (Granovetter 1973).

Organizational Learning, Social Capital, and Network Theories

Organizational learning (OL) involves the acquisition, retaining, and transfer of knowledge (Huber 1991; Robey et al. 2000). It occurs at multiple levels of an organization – the individual, group, and organization (Crossan et al. 1999) –, making it especially eligible for multilevel theorizing. Exploration and exploitation are two types of OL that have been shown to significantly affect organizational performance (e.g., Benner and Tushman 2003). Exploration is concerned with replacing existing knowledge, or developing new knowledge (March 1991). In contrast, exploitation involves incremental learning by means of diffusion, refinement, and reuse of existing knowledge (Kane and Alavi 2007; March 1991). "Organizational learning involves a tension between assimilating new learning (exploration) and using what has been learned (exploitation)" (Crossan et al. 1999, p. 523). Prior research shows that, in order to be successful

under given resource constraints, organizations need to balance these two learning patterns (March 1991). OL researchers investigate this aspect under the ambidexterity label (e.g., Gibson and Birkinshaw 2004; Gupta et al. 2006). "Ambidexterity is understood as the balanced combination of exploration and exploitation" (Mom et al. 2009, p. 1). Previous literature has shown that IT can be a driver of OL in terms of exploration and exploitation (Kane and Alavi 2007; Pentland 1995). In the following, we argue that individuals, as well as work teams can use SWS exploratively and/or exploitatively in order to leverage existing knowledge and/or to create new knowledge.

Social capital theories argue that the sum of the resources available to individuals and larger entities lies within their network of relationships (Nahapiet and Ghoshal 1998). This network, called social capital, can be grouped into structural, cognitive, and relationship capital. Structural capital represents the configuration of impersonal relationships, cognitive capital refers to shared properties such as meaning or interpretations, and relationship capital describes the nature of a relationship (e.g., trust and affect). Given that a group or team is represented by its individual members *and* its relationships, social capital theories are very appropriate for multilevel theorizing. To date, research has shown that cognitive capital influences usage intentions and patterns (Sykes et al. 2009), knowledge sharing (Wasko and Faraj 2005), and performance (Easley et al. 2003). Cognitive capital's impact is rooted in the process of individuals seeking to find a shared understanding on how to use IS and interpret its outputs (Chidamabaram 1996). The emergence of collaborative technologies such as SWS will put social networks and their associated social capital at the center of IS research (Oinas-Kukkonen et al. 2010).

Social networking theories state that ties or relationships are characterized in terms of interaction frequency between two parties and reach from weak (few interactions) to strong (many

interactions) (Granovetter 1973). Weak ties are likely to exhibit non-overlapping and new ideas, as well as new insights from new sources of knowledge (Granovetter 1983). Strong ties provide access to a homogenous pool of knowledge that have "a greater motivation to be of assistance and are more easily available" (Granovetter 1983, p. 113). Researchers found the above theories to be essential in various situations, such as the diffusion of ideas (Granovetter 1983), knowledge sharing across organizational boundaries (Hansen 1999), or knowledge sharing in electronic networks of practice (Wasko and Faraj 2005). In general, IS have been found to foster weak tie relationships amongst co-workers by establishing new weak ties (Feldman 1987; Pickering and King 1995). Strong ties as well have attracted a number of researchers who found that the stability of strong ties is reliant on affection and time (Krackhardt 1992) or that their role differs depending on culture (Bian 1997). Overall, the rise of SWS inside and outside organizations is likely to put social networks and its associated social capital at the center of IS research (Oinas-Kukkonen et al. 2010).

Conceptual Model and Hypotheses

Individual Level Model and Individual Usage of SWS in a Task

Given SWS' possible usage scenarios (e.g., job related or non-job related), a conceptualization of SWS usage should therefore be handled with care. In order to address this conceptualization issue, we follow Burton-Jones and Straub (2006) and define system usage as an activity composed of two fundamental elements: a system and a task performed by a user. SWS are used to accomplish job related tasks, such as knowledge sharing or collaboration. Researchers have measured individual benefits in terms of job productivity, job performance, decision quality, time savings, and effectiveness (DeLone and McLean 1992; Goodhue and Thompson 1995;

Igbaria and Tan 1997; Ives and Olson 1984; Livari 2005). We adhere to the definition by Goodhue and Thompson and define individual performance as "the accomplishment of a portfolio of tasks by an individual. Higher performance implies some mix of improved efficiency, improved effectiveness, and/or higher quality" (Goodhue and Thompson 1995, p. 218).

We seek to link the task dimension in the system usage construct to individual performance impact by measuring the degree to which employees use SWS features to support job-related tasks. Breadth of use has often been the measure of choice to measure a system's employment in a task, but has only established a weak link to individual performance (Burton-Jones and Straub 2006; DeLone and McLean 2002; Petter et al. 2008). We therefore follow recent recommendations from IS research that propose employing a task-specific measure (Burton-Jones and Straub 2006; Subramani 2004). This suggestion is also in line with the theory of task-technology fit (TTF), which suggests that the better a technology fits a task, the higher its performance impact is (Goodhue and Thompson 1995). We thus establish a task-centered usage measure based on the two OL concepts exploration and exploitation (March 1991), which together form the concept of ambidexterity (e.g., Gibson and Birkinshaw 2004; Gupta et al. 2006).

Concerning the level of analysis, research has mostly regarded and conceptualized ambidexterity as a characteristic of an entire business unit (Mom et al. 2009). However, ambidexterity "manifests itself in the specific actions of individuals throughout the organization" (Gibson and Birkinshaw 2004, p. 211). Following this line of thought, we regard exploration, exploitation, and ambidexterity as individual level phenomena. Individuals may thus use SWS exploratively

and/or exploitatively. Table 1 presents exploration and exploitation's main ideas in terms of SWS usage.

SWS usage for exploration	**SWS usage for exploitation**
Goals: Finding and creating new solutions to business problems based on knowledge and expertise found via SWS **Outcomes**: New solutions to existing business problems resulting in new capabilities and knowledge	**Goals**: Enhancing collaboration, communication, and coordination processes among organization employees **Outcomes**: Intangible benefits such as better coordination within projects/activities and enhanced collaboration

Table 1. Social Web Site Usage for Exploration and Exploitation

On the basis of OL, we argue that SWS usage for exploration and exploitation increases individual performance. The argument follows Schumpeter's (1976) logic that exploration and exploitation can be seen as the application of knowledge in new ways as well as in well-understood ways. The ability to perform these activities depends on an individual having knowledge available. In other words, the higher the diversity of the knowledge applied, the higher the likelihood that the outcome will be novel and groundbreaking. Conversely, the use of existing and local knowledge is likely to lead to exploitative activities, as new combinations of existing knowledge only allow incremental improvements (Fleming 1999). Furthermore, SWS offer knowledge search and retrieval features that provide access to a diverse and heterogeneous knowledge pool containing various forms of knowledge repositories, such as weblogs and wikis. Individuals using these features are exposed to a broader set of perspectives, which eventually

leads to novel outcomes, which may in turn ultimately lead to higher performance through explorative activities (Rodan and Galunic 2004; Taylor and Greve 2006). In addition to new knowledge, SWS also offer new insights into existing knowledge, which might offer new aspects of well-known activities. Hence, using such features to support well-known activities will improve individual job performance through exploitation. Following the ambidexterity literature, a combination of exploration and exploitation will eventually result in a higher performance impact (e.g., Raisch and Birkinshaw 2008; Raisch et al. 2009).

Hypothesis 1a (H1a). Individual SWS usage is positively related to individual performance impact.

Assuming that exploration and exploitation are two ends of a continuum due to the limited resources available to an individual, a higher performance impact can be expected from a balance between SWS usage for exploration and exploitation. As Gupta et al. (2006, p. 697) put it, "the scarcer the resources needed to pursue both exploration and exploitation, the greater the likelihood that the two will be mutually exclusive — that is, high values of one will necessarily imply low values of the other. Hence, following the ambidexterity literature, a combination of SWS usage for exploration and exploitation will eventually result in a higher performance impact (e.g., Raisch and Birkinshaw 2008; Raisch et al. 2009).

Hypothesis 1b (H1b). The higher the individual's balance between SWS usage for exploration and SWS usage for exploitation (i.e. ambidexterity), the higher the individual performance impact.

Team Level Model

We define teams as "collectives who exist to perform organizationally relevant tasks, share one or more common goals, interact socially, exhibit task interdependencies, maintain and manage boundaries, and are embedded in an organizational context […] that sets boundaries, constrains the team, and influences exchanges with other units in the broader entity" (Kozlowski and Bell 2003, p. 334). As a consequence, it is essential to address these characteristics when defining team level usage.

The discussion of levels of analysis is one of the most important and basic concepts for researchers in general and for multilevel theory development in particular (Rousseau 1985). When theorizing on multiple levels, the wrong choice might lead to "imprecision within the theory and confusion during data collection and analysis to test the theory" (Klein et al. 1994, p. 205). According to Klein et al. (1994), three elements – the level of the theory, the level of data analysis, and the level of data collection – need to be considered. Our research focuses on the team. However, our levels of analysis are the individual (see individual level model) and the team (team level model). Consequently, the level of theory we aim to specify refers to individuals nested within teams. This approach has several consequences for the assumptions of that theory's variability (Klein et al. 1994). Multilevel theorists depict three types of construct variability: homogeneity, independence, and heterogeneity. The first asserts that entities' members are homogenous within that entity, the second states that they are independent of that entity, and the third argues that entities' members are heterogeneous within the entity, i.e. the properties of its individual parts are assessed in relation to the whole (Klein and Kozlowski 2000b; Klein et al. 1994). We argue that team usage is a heterogeneous phenomenon, as teams may engage in differing degrees of exploration and exploitation.

Whether the function of a construct remains the same at all levels of analysis is another element that needs to be discussed (Morgeson and Hofmann 1999). That is, does team usage positively affect team performance impact? To answer this question, it is important to understand how collective structure and action emerge and how they positively influence performance. Given our basic model's assumption that individual SWS usage impacts individual performance positively, we propose that team usage, i.e. a collective action, impacts team performance positively (Devaraj and Kohli 2003; Easley et al. 2003; Mathieu et al. 2008). However, the impact of SWS usage on team performance does not emerge in the same way as it does with individual performance. This is rooted in the structure of team usage, which not only comprises aggregated individual usage, but also the interactions during usage (Burton-Jones and Gallivan 2007; Klein and Kozlowski 2000a). While this alters the structure of our usage construct at the collective level, it does not alter the output's structure. Thus, similar to our individual level, we define team performance as the accomplishment of a portfolio of tasks by a team (Henderson and Lee 1992; Janz et al. 1997). „Higher performance implies some mix of improved efficiency, improved effectiveness, and/or higher quality" (Goodhue and Thompson 1995, p. 218). In order to understand how team usage allows for better collective performance, it is necessary to understand team usage's structure (Burton-Jones and Gallivan 2007), which we subsequently discuss.

Team Usage of SWS

Team learning is central to team performance (Argote et al. 1999; Edmondson 1999). It is "an ongoing process of reflection and action, characterized by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions" (Edmondson 1999, p. 353). We argue that the usage of SWS supports this process in that several

of the involved activities and, therefore, team performance (Brown et al. 2010) are improved through collaboration, which is a central element of team learning (Alavi 1994). Within team literature (Hoegl and Gemuenden 2001; Mathieu et al. 2008), as well as IS literature (Banker et al. 2006; Easley et al. 2003) there is evidence suggesting that collaboration is associated with higher team performance and effectiveness. It has been argued that team members seek advice on the shared meaning and understanding of SWS. Such advice seeking refers to one form of *interpersonal interactions.* These interactions allow for collective action eventually forming collective phenomena, which in turn form collective constructs (Morgeson and Hofmann 1999). Interdependencies-in-use are IS related interactions in which two or more people influence and/or control each other (DeSanctis et al. 1999) through an IS's usage. Lindenberg (1997) proposes three interdependency subtypes: Functional, cognitive, and structural. *Functional* interdependencies describe the goal of interdependency, i.e. to accomplish a task. *Cognitive* interdependencies represent informal elements such as social communication and norms. Finally, *structural* interdependencies include various structural relations, such as ties to other functions and teams. For parsimony reasons, we focus on cognitive and structural interdependencies-in-use. "Collaboration behavior is characterized by attempts to identify and achieve outcomes that satisfy the interests of all parties involved. This behavior emphasizes openness to others' points of view, objective consideration of all information, and shared problem-solving toward a jointly optimal solution" (Montoya-Weiss et al. 2001, p. 1253). This definition stresses that collaboration is a collective phenomenon that cannot exist in an individual. That is, collaboration-in-use is a necessary condition for collective SWS usage to exist, and therefore a suitable candidate to measure *cognitive* and *structural* interdependencies-in-use.

We label the collaboration processes dealing with shared meaning and understanding *cognitive collaboration-in-use*. Cognitive collaboration-in-use focuses on individuals having to find a shared meaning and understanding when using an IS, in order to use a system effectively (Chidamabaram 1996; Easley et al. 2003; Majchrzak et al. 2005; Martins et al. 2004). Chidamabaram (1996) mentions a level of intimacy that develops over time and supports the usage of virtual environments. Kotlarsky and Oshri (2005, p. 45) state that "collaborative work can also be understood from a social construction viewpoint in which the quality of the relation or connection between interactants in globally distributed teams can be enhanced through storytelling and participation in social rituals." In our context, SWS are therefore regarded as a mediator for the organization's collaboration in practice (Orlikowski 2000). Further, sharing knowledge on how to use a system within a certain social context supports building trust and improves group work effectiveness (Herbsleb and Moitra 2001; Storck 2000). Along these lines, we argue that teams sharing information on how to use SWS will be more effective.

Structural collaboration-in-use are the collaboration processes dealing with structural relations. Structural collaboration-in-use focuses on individuals' ties to other people as well as their position in social networks. The availability of weak ties reportedly has a positive influence on performance of individuals (Cross and Cummings 2004) and groups (Mehra et al. 2006). Researchers have also found that structural diversity has a positive impact on performance (Cummings 2004; Jehn et al. 1999). Individuals and groups with better access to other geographic locations, functional assignments, reporting managers, and business units have access to a larger pool of knowledge than other individuals. We argue that SWS support structural diversity and the availability of weak ties in that they offer access to knowledge of rather distant organization's members. In addition to strengthening the power of weak ties, SWS also offer

prospects to find potential ties through expert or topic search. Individuals might also find potential ties by bridging weak or strong ties of their own social network. Finally, SWS are also suitable for knowledge sharing among strongly tied members of groups or teams (Wagner 2004; Wagner 2006; Wagner and Bolloju 2005). For example, a wiki could be used to collaborate on documents or tasks. In summary, we argue that we can account for structural interdependencies by measuring whether individuals use the system for within team and outside team collaboration. We thus separate structural collaboration-in-use occurring within the team (internal structural collaboration-in-use) and collaboration with individuals not part of the team (external structural collaboration-in-use). To conclude, we maintain that teams, which share information via SWS, will experience higher performance impacts than teams that do not follow this strategy. Taking all the above effects into account, we argue that team SWS usage will positively affect team performance impact.

Hypothesis 2a (H2a). Team SWS usage is positively related to team performance impact.

Further, we draw on OL (March 1991) to theorize the functional importance of our configural collective system usage construct. We argue that ambidexterity refers to the simultaneous pursuit of exploitation and exploration by adopting specific configurations (Raisch et al. 2009). Therefore, teams using SWS will try to find balanced configurations through individuals engaging in both exploration and exploitation, or splitting these tasks among team members. That is, teams with a high usage balance regarding exploration and exploitation will experience higher performance impact levels than teams with unbalanced usage. The argument put forth here is similar to H1b, with the difference that individuals in teams can engage in division of labor. Thus, "across different and loosely coupled domains (i.e., individuals or subsystems), exploration and exploitation will generally be orthogonal, in that high levels of exploration or

exploitation in one domain may coexist with high levels of exploration or exploitation in the other domain" (Gupta et al. 2006, p.697).

Hypothesis 2b (H2b). The higher the team's balance between SWS usage for exploration and SWS usage for exploitation (i.e. ambidexterity), the higher the team performance impact.

We identify cross-level effects through the interdependencies among individuals. We already noted that teams with shared understanding and meaning of how to use a system will make better use of SWS, and therefore achieve better performance impacts through their SWS usage (Chidamabaram 1996; Easley et al. 2003; Gallivan et al. 2005). However, this implies that not only the team as a whole, but also the individuals will benefit from a shared meaning and understanding with regard to SWS usage. We thus posit that cognitive collaboration-in-use positively impacts individual performance.

Hypothesis 3 (H3a). Cognitive collaboration-in-use will be positively related to individual performance impact.

Further,external structural collaboration-in-use positively impacts individual performance. Individuals usually rely on their own knowledge to perform a task. SWS give the possibility to contact others in order to gather knowledge or discuss elements that might help to accomplish job related goals. SWS extend the circle of possible contacts to assist with the problem at hand. Someone using SWS to access collective knowledge to perform his/her tasks will thus be better in accomplishing his/her job related goals. It follows then that external structural collaboration-in-use improves individual performance (Cummings 2004).

Hypothesis 3a (H3b). External structural collaboration-in-use is positively related to individual performance impact.

Figure 1 summarizes our conceptual model.

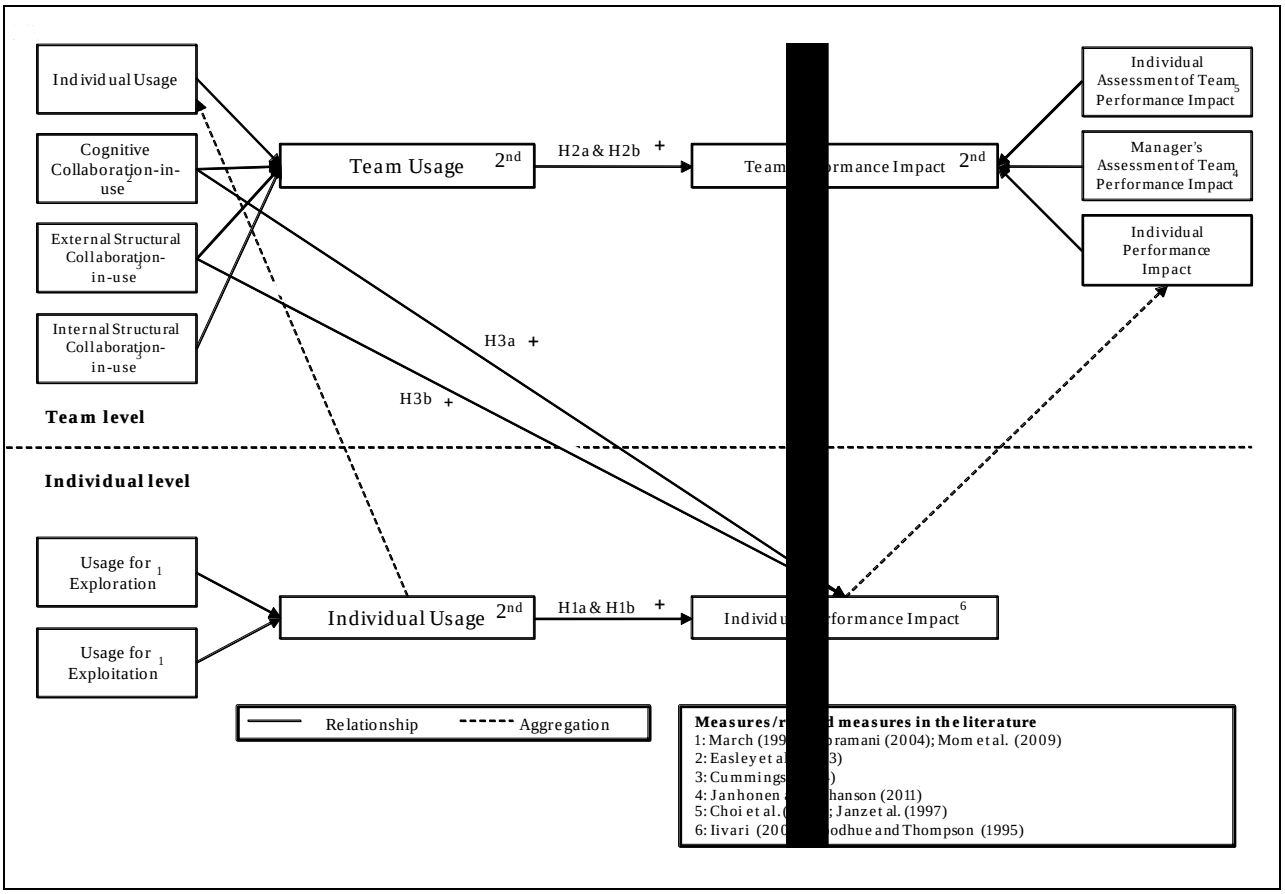

Figure 1. Team Level Model of SWS Usage and Prior Operationalization of the Respective Constructs

Research Methodology

Data for this study is collected in two phases. The first phase, which involves conducting interviews, aims at providing a preliminary validation of the proposed model's constructs and their relationships, as well as identifying possible adjustments to the model and developing an initial set of items for the constructs' conceptualizations. For this purpose, interviews are being conducted in two multinational IT firms in Europe (both with 50,000+ employees). Both organizations have launched internal SWS that are available to all their employees. All SWS used in the organizations under investigation are off-the-shelf products with minor adaptations

made to fit the organizational IS landscape. To gain a broad insight into the usage of SWS for exploration and exploitation, we interview employees from varying hierarchy levels (both sales and project oriented). We follow a semi-structured interview guideline to systematize the data collection procedure and to increase the collected data's comprehensiveness (Patton 2002). We have conducted ten interviews (six in one company, four in the other) so far and are currently transcribing and analyzing them. The preliminary analyses of the interviews support our model's constructs and relationships.

In the second data collection phase, we will launch a survey to validate the proposed model. We have therefore established an initial item pool for our measurement instrument. This item pool is based on established measures as proposed in the literature[1], as well as on the SWS exploration and exploitation scales developed on the basis of interview results and the literature. Given that our team performance, individual usage, and team usage constructs have several dimensions but belong to the same theoretical concept, we propose an aggregate higher-order construct for measuring these constructs. The "2nd" notation appearing in some of the constructs in figure 1 points out that the respective constructs are set up as second-order constructs as proposed by Edwards (2001). Aggregate higher-order constructs are used to represent several distinct dimensions as a single theoretical concept (Edwards 2001). The constructs unite several dimensions into a common concept and can, for illustrative purposes, be regarded as similar to formative measures (Edwards 2001). The theoretical utility of such constructs is sometimes contested on the grounds of its inferiority to multivariate models. However, along with Edwards (2001, p. 149), we think that "this dilemma may be ameliorated by developing theories that

[1] We are aware that this practice is not superior to revalidating or creating new construct measures. Our rationale is derived from theoretical considerations such as ensuring comparability and accumulating knowledge (see Boudreau et al. 2001).

incorporate multidimensional constructs along with their dimensions." Thus, we develop team performance, individual usage, and team usage as multidimensional constructs.

The next step of the survey instrument refinement will involve an in-depth validation of the developed instrument prior to launching the actual survey. To ensure the item pool's content validity, we will employ established procedures (e.g., card-sorting and the item-ranking approach) (Davis 1989; Moore and Bensabat 1991). In order to ensure the survey instrument's quality, we will discuss the draft with an expert panel (semi-structured, face-to-face interviews) and implement their feedback. We will subsequently further adjust the items if important aspects of a construct's content domain are not as yet covered. In the last step to validate the research instrument, we will launch a Web-based pre-test with selected participants. To empirically validate the proposed model, we will eventually launch the survey instrument in the field. Using the survey's empirical data, the instrument's psychometric properties will be explored by applying second-generation modeling techniques (for analysis at a single level), as well as hierarchical level modeling (for nested entities and cross-level connections) (Hofmann 1997). Following the validation guidelines of Straub et al. (2004) and Lewis et al. (2005), we will test the measurement model for reliability, convergent validity, discriminant validity, and predictive validity. The aggregate measures' viability will be tested using intra-class correlation (ICC) and the reliability of the group mean (Bliese 2000). For purposes of measuring combined constructs, we aim to use multiplicative interaction to compute ambidexterity (Brambor et al. 2006). Given an adequate measurement model, the structural model will be analyzed to test the associations hypothesized in the research model.

Conclusion and Outlook

We proposed a conceptual model for measuring SWS usage's impact on individual and team performance. Our theoretical contribution lies in the conceptualization of a multilevel model, as well as in the outline of an initial model for measuring SWS' performance impact by regarding SWS usage as a collective phenomenon. Our practical contribution lies in providing an instrument with which corporations can measure SWS usage and its performance impacts on their organizations.

For future advancement of the model, we plan to consider SWS usage's context in our model. Knowledge workers encounter a wide spectrum of knowledge needs, which depend on different institutional and individual application adoption decisions in real world settings (Jasperson et al. 2005). For example, employees who have to follow strict process parameters will probably not be inclined to frequently exchange or seek knowledge. Their tasks mainly center on well-defined processes that usually do not require flexible knowledge exchange. On the other side of the spectrum, employees who regularly have to deal with novel or unstructured business problems are tied to their access to knowledge resources and depend on exploring other people's knowledge. We thus plan to integrate Goodhue and Thompson's (1995) task characteristics measures, which describe task equivocality (e.g., uncertainty) and task interdependency (e.g., the extent to which a task relies on relations with other individuals), into our model as moderators. Besides the tasks that a knowledge worker performs, a work environment's virtuality (e.g., geography, work practices, and organizational climate) might also have a considerable impact on the relationship between SWS usage and performance impact. Hence, SWS are used in various contexts within an organization. Consequently, we will reflect the context when examining the usage of SWS within organizations.

Our research is limited in that it is only based on explorative, semi-structured interviews, literature, theory, and our own experience. Thus, it needs further elaboration in the upcoming evaluation stages described above.

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