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The Influence of Organizational Trust and Organizational Mindfulness on ERP Systems Usage

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Abstract:

This paper examines how organizational trust and organizational mindfulness shape enterprise resource planning (ERP) system usage. We focus on five dimensions of trust: competence, openness and honesty, concern for employees, reliability, and identification. Drawing on organizational trust and organizational mindfulness theories, we argue that perception of organizational trust among ERP users might explain ERP system usage. We also predict that organizational mindfulness among ERP users positively influences ERP system usage. Our study draws on a total of 231 questionnaires collected from ERP system users across the United States. The results suggest that organizational trust dimensions (namely, competence, concern for employees, and identification) affect ERP system usage. Consistent with the theory, the results also support the idea that organizational trust (i.e., competence, openness and honesty, concern for employees, and identification) create supportive infrastructure-enabling organizational mindfulness. Finally, the study shows key antecedents of organizational mindfulness and underscores the importance of organizational mindfulness as a way of encouraging ERP system usage.

Keywords: ERP System Usage, Organizational Trust, Organizational Mindfulness.

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I. INTRODUCTION

Over the past decade, the popularity of enterprise resource planning (ERP) systems has surged as businesses have attempted to streamline business processes and integrate all aspects of their business into an integrated information system platform. Expecting that such systems will boost performance, generate value, and sustain competitive advantage in an increasingly competitive and aggressive business environment, businesses continue to invest in ERP systems. Although many organizations can boast that they have successfully deployed and used ERP systems to enhance operational efficiencies and other far-reaching positive changes (Hebert & Oppenheim, 2004; Jones, Zmud, & Thomas, 2008), research suggests that many other organizations still grapple with how to translate pre-implementation expectations into actual ERP success (Barker & Frolick, 2003; Swanton, 2004). Such organizations are left to rue the performance gap associated with post-ERP implementation.

One key area that has come under scrutiny is the extent of end users' usage and appropriation. ERP system users tend to limit the use of ERP systems and typically use other information systems for discretionary task routines even though the very logic of ERP system is to integrate disparate applications (Elbertsen, Benders, & Nijssen, 2006). Studies attribute this limited ERP usage to the absorption capacity of users to understand, assimilate, and apply ERP knowledge effectively (Park, Suh, & Yang, 2007), and to the dearth of localized features arising due to the inability of global ERP packages to readily address specific functional needs among end users (Kwahk & Ahn, 2010). Poor understanding of ERP systems may cause users to create and reenact workarounds (Markus & Tanis, 2000). Unfortunately, these workarounds can continue indefinitely, thereby limiting ERP use and assimilation (Liang, Saraf, Hu, & Xue, 2007). For instance, Boudreau and Robey (2001) discuss how a state university continued to maintain a parallel shadow system and how users found it difficult to migrate from the university's legacy system after ERP implementation. Yet the success of an ERP system is intrinsically tied to the extent of usage and appropriation by end users in the firm that uses it (Boudreau & Robey, 1999).

ERP system usage includes both mandatory and optional usage. Amoako-Gyampah and Salam (2004) argue that mandatory usage represents the basic level requirement needed to perform minimal job routines. Usage that goes beyond that may be voluntary, thus limiting management ability to force usage. Existing literature has alluded to perceived voluntariness as vital in the acceptance and use of technology (Agarwal & Prasad, 1997). Thus, in situations where usage is mandatory, users' participation is typically effective when users believe that they have some control over the outcome of their effort (Hunton & Beeler, 1997). Given that system usage is a major determinant of productivity (DeLone & McLean, 2003) and that organizational benefits cannot be achieved without ERP system usage (Amoako-Gyampah & Salam, 2004), promoting ERP system usage is essential for organizations. However, the information system (IS) literature offers little guidance for the management of organizations who must grapple with the dilemma presented by the need to promote ERP system usage. The prevalent view of using technology, as reflected in contemporary work on information technology (IT) usage, seem to focus on desired outcome, thus neglecting other organizational aspects of IT use. Furthermore, recommendations on ERP system usage tend to focus on critical success factors of the initial ERP implementation, while ignoring the impact of such crucial factors as organizational trust and mindfulness on ERP system usage.

Studies show that organizational trust is positively related to such organizational outcomes as productivity, job satisfaction, decreased absenteeism, and turnover (Driscoll, 1978; Hopkins & Weathington, 2006; Perry & Mankin, 2007). Moreover, the level of trust employees have in their organization is fostered through interaction between co-workers and the organization's leadership. While prior studies have examined organizational trust and its impact on technology, their effect on system usage has received little attention. Therefore, since ERP systems are associated with organizational changes and involve uncertainties, it is crucial to examine the impact of organizational trust on ERP system usage. In addition to trust, the concept of mindfulness has been applied to organizations that pay attention to the dynamic environment around them and maintain the ability to react and cope with changes crucial for upholding reliable performance.

Prior research has highlighted the importance of organizational mindfulness when dealing with IS projects. For instance, Swanson and Ramiller (2004) identify organizational mindfulness as a key factor in overcoming the issues related to selecting and adapting IS innovations. Moreover, with respect to ERP systems, organizational mindfulness can lead to fewer implementation problems (Sammon & Adam, 2010). To our knowledge, prior research has not investigated the impact of organizational mindfulness on ERP usage.

This paper extends the ERP system usage literature. Drawing on prior research and theories on organizational trust and organizational mindfulness, we specifically designed a research model to investigate how organizational trust and organizational mindfulness affect ERP system usage. This paper contributes to the literature in several ways. First, it shifts away from the technology-centric research on ERP usage and focuses on using organizational factors and characteristics to understand ERP usage. Second, it develops a theoretical model that captures organizational trust and organizational mindfulness and shows how these constructs associate with ERP system usage. Finally, it provides guidance for managers who wish to understand how to encourage ERP system usage.

This paper is organized as follows. In Section 2, we review the background literature on ERP system usage, organizational trust, and organizational mindfulness. In Section 3, we present the research model and the research hypotheses. In Section 5, we report an empirical study based on data collected from U.S. organizations, and present the data analysis and the results. In Section 6, we conclude with a discussion of research findings and implications for theory and practice.

II. THEORETICAL BACKGROUND

ERP System Usage

ERP system usage refers to the degree to which users use installed ERP functionalities (Burton-Jones & Gallivan, 2007; Jones et al., 2008; Venkatesh, Speier, & Morris, 2002). System usage is one of the important factors that enhance benefits derivable from an ERP installation. Hence, system usage has been one of the most frequently used measures of IS success (Jonas & Björn, 2011). Existing literature has investigated ERP system usage to understand how the system is assimilated into the organization. Jonas and Björn (2011) developed a measure of ERP usage and note that, because an ERP system is a unique and complex system, measuring ERP system usage requires capturing organizational system, business processes integration, scope of functionality, and the current number of potential users. And Lin (2010) found that IS quality and top management support influenced ERP system usage through users' perception of the usefulness and satisfaction with the system. Similarly, Chang, Cheung, Cheng, and Yeung (2008) identify system compatibility and social factors as important determinants of ERP system usage.

Problems with ERP system usage can result in a failure to achieve the expected ERP benefits. Existing literature has identified factors affecting ERP system usage in the post-implementation stage. Peterson, Gelman, and Cooke (2001) argue that a lack of user understanding of the ERP system tends to affect system usage, while Nicolaou (2004) discuss how inadequate training, insufficient support for end users, and the lack of communication of system objectives can negatively affect end users' ability to understand the newly adopted business processes and lead to poor system usage. Others have identified ineffective change management and the severity of the implementation mode as factors affecting system usage (Motwani, Mirchandani, Madan, & Gunasekaran, 2002).

Problems with system usage can discourage ERP users from continually using the system and can cause them to resist and even refuse to use the system or find a way around using it (Boudreau & Robey, 2005). Therefore, it is crucial to identify and implement various mechanisms available for overcoming ERP usage problems. This paper investigates organizational trust and organization mindfulness as potential factors that can positively influence system usage and overcome some of these issues.

Organizational Trust

Researchers and practitioners have acknowledged that organizational trust is an important aspect of organizational life; however, its definition remains complex and ambiguous. Common to the many definitions for organizational trust that exist is that it is communication based, dynamic, multidimensional, and not sufficiently understood (Ellis & Shockley-Zalabak, 2001). Mishra's (1996) model of organizational trust stands out as the theoretical underpinning for current research. This model identifies four dimensions of trust: competence in organizational leadership, openness and honesty, leadership concern for organizational members, and reliability (Mishra, 1996). Ellis and Shockley-Zalabak (1999) proposes "identification" as a fifth dimension of organizational trust in a bid to capture how individuals manage and identify with their organizations.

This papers focuses on employees' perception of trust in their organization. Building on Mishra's (1996) model of organizational trust, we define the term as the confident and positive expectations individuals, groups, or organizations have about the intent and behaviors of organizational members based on organizational roles, relationships, interactions, and experiences. Indeed, the expectation of both the trustee and trustor and the behavioral intention to act on that expectation are required for trust to exist (Moorman, Deshpande, & Zaltman, 1993). Trust is thus based on the positive expectation that each party will not be taken advantage of. It requires both parties to eliminate opportunistic behavior.

The impact of organizational trust on organizations' performance and effectiveness has also received some attention (Jones & George, 1998; Mayer, Davis, & Schoorman, 1995). Organizations with high levels of internal trust tend to be more successful, adaptive, and innovative than those without (Shockley-Zalabak, Ellis, & Winograd, 2000). Such trust can facilitate teamwork, leadership, organizational commitment, and the likelihood that employees will embrace the firm's strategic goals and objectives. Organizational trust has been linked to economic performance and perceived satisfaction (Ellis & Shockley-Zalabak, 2001). While one can see organizational trust as being dyadic in nature in its involvement with organizational leaders and employees, Zaheer, McEvily, and Perrone (1998) argued that organizational trust is deeply rooted in individuals, and that the individual members of the organization are saddled with the propensity to trust rather than the organization itself. However, organizational culture, value, and society may shape the propensity to trust (Fukuyama, 1995; Huff & Kelley, 2003).

The management science literature identifies organizational trust as a multidimensional construct with various dimensions contributing to its makeup (Ellis & Shockley-Zalabak, 1999; Mishra, 1996). Thus, organizational trust can be established if individuals in the firm exhibit a high degree of trust in these key dimensions, all of which are based on common beliefs that individuals or groups act in ways that are in the best interests of the concerned parties. Understanding these dimensions can assist organizations in creating an environment capable of cultivating trust, communicating that trust to employees, and determining the level of trust in the organization. Drawing from previous works on organizational trust by Mishra (1996) and Ellis and Shockley-Zalabak (1999), we use the five well-established key dimensions that capture organizational trust.

Competence

The first dimension, competence, refers to the proficiency in organizational leadership and the organization as an entity (Mishra, 1996; Ellis & Shockley-Zalabak, 1999). This dimension involves seeing co-workers and leaders as being effective. Competence measures how strongly one believes that their organization will compete and survive in the business environment. Moreover, trust is treated as an issue of competence where employees trust those who can solve problems and deliver desired results. In terms of an ERP system, to the extent that an organization's competence meets its employees' expectations, employees will no longer question the benefits and value of using an ERP system before accepting it.

Openness and Honesty

Mishra (1996) refers to the second dimension that captures organizational trust as openness and honesty. The concept includes sincerity of communication (Bulter, 1991; Ellis & Shockley-Zalabak, 1999). This dimension measures how sincere and appropriate information is communicated by the organization to its members. Employees' ability to perceive that information is shared accurately, sincerely, and abundantly is critical in establishing organizational trust. In addition to that, openness and honesty are also aspects of followers' trust in leaders (Kirkpatrick & Locke, 1991; Nanus, 1989). Kirkpatrick and Locke (1991) argue that trusted leaders are more able to encourage change and innovation, acquire skills, and attract and retain followers. From an ERP system's perspective, having a management team which is open and honest implies that it is easier to attract employees who believe and understand the necessity of the system and its use. Furthermore, employees are willing to accept the vulnerability created by the introduction of an ERP system if they believe that leadership is open and honest and will not take advantage of this vulnerability.

Concern for Employees

The third dimension that fosters organizational trust refers to the degree to which organizational leaders express concern for organizational members (Cummings & Bromiley, 1996; Ellis & Shockley-Zalabak, 2001). Employees' perceptions of empathetic and tolerant acts on the part of management and management's concern for employee safety contribute to high trust levels in any relationship. Furthermore, this dimension also means that one party believes that the other party will not be opportunistic and take advantage of the other (McGregor, 1967). For instance, employees can trust that organizational leaders will not only refrain from taking unfair advantage of them, but that they will also be concerned about the employees' interests. Therefore, when it comes to ERP systems and usage, having organizational trust means employees are confident that leadership will not exploit them; rather, it will direct them to the optimal way to use the system.

Reliability

The fourth dimension fostering organizational trust is reliability. Reliability is determined by whether co-workers, teams, or organizations act in a consistent and dependable manner. Organizational reliability is accomplished through the development of highly standardized routines (Hannan & Freeman, 1984). In his work, Ouchi (1981) refers to trust in terms of expectations for consistent and reliable behavior. Similarly, Gabarro (1987) defines trust between managers and employees in terms of reliability and consistency of behavior. Trustworthiness in leadership has also been defined in terms of leaders' reliability (Kirkpatrick & Locke, 1991). When dealing with an ERP system,

having a reliable management team means that employees can expect consistency of action and without unwanted variance in performance.

Identification

The fifth dimension fostering organizational trust refers to identification; that is, how employees and individuals in the organization share norms, values, and beliefs associated with the organizational culture. Indeed, if members identify with the organization, they will be more likely to perceive a higher level of organizational trust (Ellis & Shockley-Zalabak, 1999). On the contrary, when employees feel estranged from the organization, they have lower levels of organizational trust and effectiveness (Ellis & Shockley-Zalabak, 1999). In terms of ERP systems, when employees identify with their organization, they are more likely to communicate with increased trust with regards to the system.

Organizational Mindfulness

Organizational mindfulness refers to the degree to which an organization captures detail about emerging threats and creates the capability to promptly act on these details (Weick, Sutcliffe, & Obstfeld, 1999; Weick & Sutcliffe, 2001; Vogus & Sutcliffe, 2012). Mindfulness involves creating a state of alertness and active awareness, being open to new information, and maintaining the ability to act (Weick et al., 1999). Mindfulness is derived from the works of psychologists who identified certain cognitive qualities in individuals that made the individuals aware of multiple perspectives and enabled them to stay situated in the present moment (Langer & Moldoveanu, 2000).

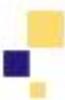
The concept of mindfulness emerged in the organizational science literature and has been extended from individuals to organizations in a bid to understand what separates high-reliability organizations from other, less-reliable organizations (Weick & Sutcliffe, 2001; Weick et al., 1999; Ray, Baker, & Plowman, 2011). Weick et al. (1999) argue that high-reliability organizations derive the ability to avoid mistakes and the ability to successfully navigate trying conditions of complexity from organizational mindfulness. Indeed, one can view organizational mindfulness specifically in terms of its effect on adaptive uniqueness, capacity for action, and strength of insight (Weick & Putnam, 2006).

Mindfulness and IT have received some note in the literature. Swanson and Ramiller (2004) argue that mindful enterprises are able to assimilate IT innovation efficiently because these enterprises shun rapid acceptance and closure and remain open to surprises, continued learning, and unanticipated complications. Similarly, Fichman (2004) calls for an empirical understanding of mindfulness and its impact on IT-enabled innovation. With respect to ERP systems, organizational mindfulness implies that organizations direct enough attention towards identifying and anticipating possible problems and errors in the system that might affect system performance and usage. For instance, a mindful organization encourages ERP end users to report system errors and potential improvement opportunities in order to improve users' experience. Additionally, a mindful organization is able to detect and benefit from adaptation opportunities between an ERP system and organizational practices. These opportunities can lead to the system's effective assimilation and a better user experience (Mu, 2007).

Thus, a mindful approach to an ERP project can lead to a successful project outcome (Sammon & Adam, 2010). Mindful organizations regularly discuss potential threats to reliability, develop models that question the adequacy of existing assumptions, and pay attention to details in such a way that facilitates rich thinking and recognize the inevitability of setbacks, while coping and learning from their mistakes and retaining the capability to act (Weick et al., 1999; Weick & Sutcliffe, 2007; Vogus & Sutcliffe, 2012). For example, when they deal with ERP systems, end users who are involved with a system's daily operations are likely to report usage problems that impede system usage. Therefore, when mindful organizations deal swiftly with such issues, they prevent further escalation of the problem that could affect system usage.

III. RESEARCH MODEL AND HYPOTHESES

Building on the background literature discussed above, Figure 1 provides a research model underlying our study. The specific hypotheses are discussed below.



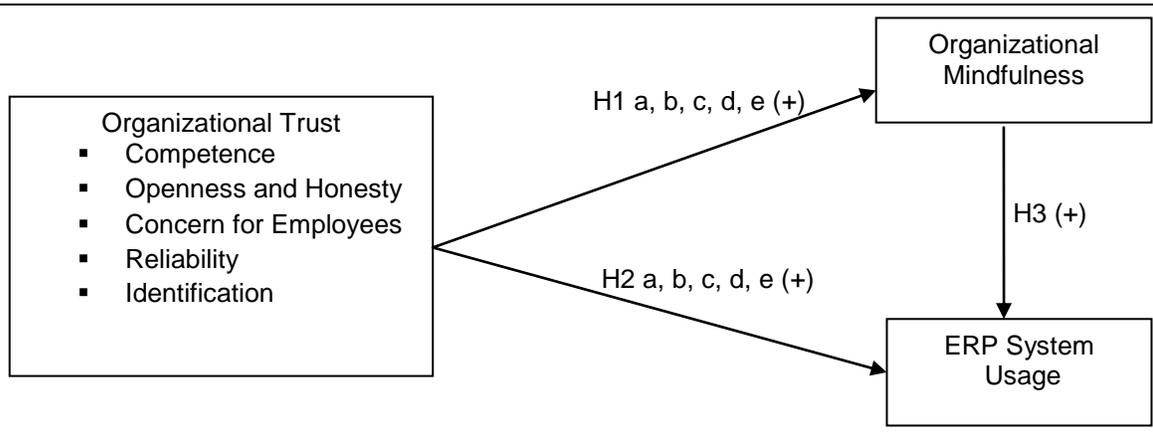


Figure 1. Research Model

Impact of Organizational Trust factors on Organization Mindfulness

As discussed earlier, the ability of an organization to develop trusting relationship with its employees is crucial. Such trust enhances communication with top management and ensures that workers embrace and support the firm's strategies and culture. Employees who establish trust with their organizations tend to have a high propensity to embrace its values, norms, and culture. Mindfulness implies not only that an organization detects unexpected stimuli and remains sensitive to the environment, but also that the organization is able to act on the identified cues (Weick & Sutcliffe, 2006). Thus, to nurture mindfulness, organizational members need to trust that the organizational leadership whom they identify with is competent, reliable, caring, honest, and open.

In order to establish mindfulness, organizational members must be empowered to seek new ideas and information so that they can challenge each other's thoughts and ideas without fearing negative effects or penalties. A culture of trust provides a setting where people do not fear breaking new ground, taking risks, and experimenting (Hoy, Gage, & Tarter, 2006). Moreover, a mindful organization ought to have reliable and competent leaders whom members can identify with and depend on for support. In terms of ERP systems, having a culture of trust provides an environment where end users are not afraid of taking risks, making mistakes, and experimenting with system usage. With such trust in place, ERP users can go beyond mandatory usage of the system and seek new ways the system can be deployed in other related task routines. Organizational trust can provide a strong incentive for workers who grapple with understanding the course and direction of their organizations. Arguably, organizational members' confidence in their firm's ability to show concern and empathy for them can influence members' ability to act in decisively when faced with uncertainties. Thus, the inherent trust existing in an organization may limit or influence the organization's ability to remain attentive to its surroundings and its capacity to act on unexpected signals. Indeed, creating a culture that encourages rich thinking and fosters a capacity for action may be insufficient if organizational trust is lacking. A mindful organization may enact practices and structures that work to ensure more mindful ways of acting, thinking, and organizing; yet, such actions may not be effectively deployed if organizational trust is missing in the establishment. Organizational mindfulness works to create context by signaling what the organization expects, rewards, and supports (Ray et al., 2011). Without trust, such signals may not be properly conveyed and interpreted.

Competence and Organization Mindfulness

As mentioned earlier, competence-based trust denotes the ability of organizational leadership and the organization as an entity to execute and achieve desired outcomes (Mishra, 1996; Ellis & Shockley-Zalabak, 1999). In the context of organizational mindfulness, examining competence is essential because how strongly one believes that their organization will compete and survive in the business environment can enhance or impede the degree to which one actively entertains new information and captures emerging threats. However, this relationship has not been tested alongside other important trust-building dimensions. A review of the extant literature suggests competence is an important belief that positively influences performance (see, e.g., King & Zeithaml, 2001; Tippins & Sohi, 2003).

The perception of an organization's competence allows its members to grow more confident of their own abilities, of their managers', and of their organization's existing programs and procedures (Weick & Putnam, 2006). Indeed, mindful organizations tend to demonstrate a high level of competence (Swanson & Ramiller, 2004). Nevertheless, Weick and Sutcliffe (2001) add a cautionary note that, while competence is a vital element in organizational mindfulness, success does not always demonstrate competence. Assumptions of competence based on a firm's success can introduce complacency, inattention, and habituated routines and thus limit mindfulness.

We assert that competence powerfully influences mindfulness because the perceptions that an organization is capable and proficient in its operations can bolster the degree to which organizational members attend to signals, deviations, emerging threats, and opportunities. We hypothesize that the overarching trust that competence brings in the organization should strongly signal organizational mindfulness.

H1a: *Competence positively influences organizational mindfulness.*

Openness and honesty and organization mindfulness

Signals of organizational trust stem not only from the competence of organizational leadership but also from sincerity and accuracy of information communicated to organizational members (Bulter, 1991; Mishra, 1996; Ellis & Shockley-Zalabak, 1999). We looked at how broader openness and honesty in an organization might influence mindfulness. Openness and honesty, which increase the overall trust in organization leadership (Kirkpatrick & Locke, 1991), is an enabler for innovation and adaptive uniqueness associated with mindfulness. The openness and honesty that high-trust environments make possible facilitates communication and confers a competitive advantage to the organization in times of change and unrest (Mishra, 1996). Openness to novelty, which involves the ability to reason about new kinds of stimuli, is vital to organizational mindfulness (Butler & Gray, 2006). This openness is particularly important because, in such organizations, members view mistakes as opportunities for learning and refinement rather than for blame and castigation (Tschannen-Moran, 2003), which enables greater mindfulness in the organization. Hoy et al. (2006) argue that, when trust and mindfulness converge, managers can cultivate an atmosphere of openness and teamwork and encourage employees to challenge each other's thoughts and behavior. In sum, we expect that perceptions of openness and honesty will influence organizational mindfulness since the belief of openness and honesty captures one's expectation about accurate disclosure of problems and timely diagnosis of problems before they are compounded. Therefore, we hypothesize:

H1b: *Openness and honesty positively influence organizational mindfulness.*

Concern for employees and organization mindfulness

As mentioned earlier, concern for employees refers to the degree to which organizational leaders express care, empathy, and tolerance for organizational members. Prior studies have shown concern's importance for employees in promoting trust in organizations (Mishra, 1996). In the context of organizational mindfulness, examining the concern for employees is vital because mindful organizations continuously search for problems in day-to-day operations (Weick & Sutcliffe, 2001). This continuous scanning for problems requires a close relationship between the organization and its members (Hoy et al., 2006). The perception of concern for employees among organizational members nurtures this close relationship and fosters an atmosphere that breeds organizational mindfulness—a way of working characterized by a focus on the present, an attention to operational detail, and a willingness to consider alternative perspectives and to examine failures (Langer, 1989; Weick & Sutcliffe, 2001). However, a lack of sensitivity to operations and employees causes distrust and an information gap, which factors delay timely responses and hinder rich thinking (Hoy et al., 2006). We propose, therefore, that increased concern for employees will lead to higher organizational mindfulness.

H1c: *Concern for employees positively influences organizational mindfulness.*

Reliability and organization mindfulness

Reliability has been well documented as a strong signal of organizational trust (Gabarro 1987; Kirkpatrick & Locke, 1991). Researchers generally support the notion that trust building requires organizations to act in a consistent and dependable manner (Ellis & Shockley-Zalabak, 2001; Hoy et al., 2006). Furthermore, reliability involves an organization's employees' ability to believe that the organization's words are backed by action and consistent behavior. In the context of organizational mindfulness, organizational reliability depends on sense making and responsiveness under extreme time pressure (Swanson & Ramiller, 2004). Perception of organizational reliability enables employees to trust that their organization is capable of comparing, contrasting, making judgments, and identifying, bouncing back from, and overcoming mistakes early on. We argue that such capacity is predicated on the degree to which an organization's members trust that the organization and its leadership are dependable, reliable, and capable of acting positively on the mistakes identified. We consider employees' perception of reliability in the organization alongside other trust-building dimensions. We hypothesize, therefore, that increased reliability in an organization will lead to higher organizational mindfulness.

H1d: *Reliability positively influences organizational mindfulness*

Identification and organization mindfulness

As previously discussed, how employees and organizational members identify with the values, norms, culture, and beliefs of an organization fosters organizational trust building (Mishra, 1996; Ellis & Shockley-Zalabak, 1999). Prior research has linked identification with lowered turnover intentions (Tyler & Blader, 2000), increased extra-responsibility behavior (Dukerich, Golden, & Shortell 2002), and increased job satisfaction (van Knippenberg & van Schie, 2000). Similarly, Shadur, Kienzle, and Rodwell (1999) argue that identification creates an employee's feeling of commitment leading the individual to embrace opportunities for teamwork, participate in decision making, and to communicate more. Organizational mindfulness requires an atmosphere of teamwork, adaptive decision making, and communication (Weick & Sutcliffe, 2007). Furthermore, mindful actions can create initial vulnerabilities, failures, and uncertainties (Vogus & Sutcliffe, 2012); and identification, we argue, fosters a perception of common value and belief that reinforces the notion that mistakes and failures are opportunities for learning and improvement. Identification provides a setting in which people do not fear breaking new ground and experimenting. Thus, we hypothesize that increased identification will lead to higher organizational mindfulness.

H1e: *Identification positively influences organizational mindfulness*

Impact of Organizational Trust factors on ERP System Usage

When organizations decide to implement ERP systems, the organizational expectation is that the system will streamline business processes and integrate hitherto disparate systems across functional areas of business into an integrated platform (Nwankpa & Datta, 2012). Such an expectation is based on the understanding that the inherent business processes, the integration, and the functional superiority of an ERP system will lead to improved efficiency and competitive advantage. An ERP system's usage captures the extent to which users employ installed ERP functionalities (Burton-Jones & Gallivan, 2007; Jones et al., 2008; Venkatesh et al., 2002). This usage can take place only if users are familiar with the system's configurations and functionalities. Employees faced with newly transformed processes created by ERP systems can be so overwhelmed that they limit the use of the ERP system. For instance, employees that have perfected their routines with the firm's existing system are suddenly required not only to change how they perform their tasks, but also to face a learning curve in assimilating new routines and associated business processes (Sarkis & Sundarraj, 2003). Current literature suggests that many organizations experience unfavorable reactions from end users after the deployment of an ERP system (Ross & Vitale, 2000; Saeed, Abdinnour, Lengknick-Hall, & Lengknick-Hall, 2010). Therein lies the problem because management will seek to communicate trust and confidence in an ERP system to organizational members and ERP system end users who may not adequately comprehend the system's benefits. This is especially the case given the turbulent nature of ERP system implementation and the change-management issues associated with its implementation.

Lack of trust in an ERP project may lead to strained relationships, poor cooperation, and employee resentment (Rose & Schlichter, 2013). Organizations with high internal organizational trust tend to have strong employee relationships, and these employees are more likely to embrace management changes. Users may therefore feel more comfortable with the ERP system deployment and may indeed embrace the system because of the confidence and trust attached to their organization.

Competence and ERP system usage

The impact of organizational competence on ERP system implementation and its use is well documented (Davenport, 2000; Motwani et al., 2002; Krammergaard & Rose, 2002). Organizational competence is particularly important because it helps organizations understand why management chose an ERP system, how organizational processes will change, and how the resultant potential business benefits can be realized (Krammergaard & Rose, 2002). Similarly, Somers and Nelson (2001) argued that technological competence is among the important factors affecting ERP system deployment and the probability of conversion success. Also, Wang, Lin, Jiang, and Klein (2007) suggest that technological competence facilitates acceptance of the ERP system among users especially at the early state of the process, which is a key condition for usage. Such acceptance is vital because of the complexity and uncertainty associated with ERP systems.

In the same vein, Ibrahim and Ribbers's (2009) findings suggest that trust influences the use of interorganizational systems and, more specifically, that competence-trust positively influences the use of resources related to interlinkage of business processes and organizational domain knowledge systems. We argue that competence-based trust enables employees to embrace an ERP system and believe that its use is for the greater good of an organization. As users gain trust in the ability of their organization to effectively implement and apply an ERP system, they acquire greater comfort and belief in the ERP system, which creates an atmosphere that fosters ERP usage. Furthermore, competence-based trust reduces employees' concern that their organization will act opportunistically and reinforces users' trust that the organization is capable of solving emerging ERP system

problems and delivering desired results. We propose, therefore, that increased competence will lead to higher ERP system usage.

H2a: *Competence positively influences ERP system usage.*

Openness and honesty and ERP system usage

Openness and honesty-based trust have received some note in the IS literature. For instance, Ibrahim and Ribbers (2009) investigated an interorganizational systems (IOS) and found that trust based on partner organizations' openness influenced the use of IOS-related resources. Similarly, Elbanna (2013) argue that openness and honesty promotes trust in an organization and encourages top management support in an IS implementation project. Typically, organizations that favor openness and honesty have the propensity to seek solutions and improve on their existing technology infrastructure. Openness and honesty will lead to the development of trust and exchange of information needed to overcome the barriers associated with technology acceptance and use (Amoako-Gyampah, 2004). As a result, having organizational leadership that is open and honest creates effective communication, and such communication leads to a shared sense of understanding of why a technology, such as an ERP system, is being used (Amoako-Gyampah, 2004). Such understanding will more likely lead to increased ERP assimilation and use. We propose, therefore, that the degree to which users use and explore the capacity of their ERP system may be influenced by their perception of their organization's openness and honesty.

H2b: *Openness and honesty positively influence ERP system usage.*

Concern for employees and ERP system usage

Prior research has not addressed the direct impact of concern for employee-based trust on ERP system usage. However, existing literature suggests that concern for employee-based trust creates a mutual understanding between employees and their organizations (particularly with regard to career goals and development opportunities) (Ellis & Shockley-Zalabak, 2001). ERP system implementations create new learning curves, different employee responsibilities, and, in some cases, new sets of skills (Amoako-Gyampah & Salam, 2004), and employees need to contend with these emerging challenges. Concern for employee-based trust, we argue, reinforces the conviction that ERP-implementing organizations will not use the ERP system to take unfair advantage of workers. Rather, they will use the technology to attain mutual goals. For instance, if employees perceive organizational leadership as showing concern for employees, they will not only embrace ERP systems as being beneficial to both parties, but will be more likely to accept the challenges associated with the ERP use. Also, research suggests that organizations that exhibit greater concern for employees are more likely to invest in user training and other helpful procedures that enable greater ease of use and assimilation of the ERP system (Nwankpa et al., 2013). We propose, therefore, that increased concern for employees will lead to high ERP system usage.

H2c: *Concern for employees positively influences ERP system usage.*

Reliability and ERP system usage

As mentioned, reliability-based trust is established after repeated interaction in an organization. It leads to predictability and confidence in future actions. This consistency of action leads to stakeholders' trust (Ellis & Shockley-Zalabak, 2001). Handfield and Bechtel (2002) argue that organizations or people who meet a threshold level of predictability achieve reliability and can be trusted. Prior research has examined reliability-based trust and the use of technology. For instance, Galizia (2006) argues that, in an e-commerce platform, security services such as authentication, data integrity, and confidentiality are implemented to capture the reliability-based aspect of trust, and, without such trust, usage becomes limited. Similarly, Ibrahim and Ribbers (2006) suggest that reliability-based trust is critical to the use of human-based resources and resources that enable business-process integration. Thus, we argue that having a reliable management team creates a perception of trust that the use and absorption of the ERP system will be in the best interest of all parties involved. We propose, therefore, that increased reliability will lead to higher ERP system usage.

H2d: *Reliability positively influences ERP system usage.*

Identification and ERP system usage

Identification-based trust is a trust dimension that develops when one party has "fully internalized the other's preferences" (Shapiro, Sheppard, & Cheraskin, 1992, p. 371). Sabherwal (1999) suggest that identification-based trust implies that parties understand each other and appreciate each other's wants to the point that one party is able to act as an agent for the other. Identification-based trust is particularly important for technologies that cut across business processes, or such organizational boundaries as supply chain systems and collaborative commerce



applications (Li, Du, & Wong, 2005). In the context of ERP system usage, we argue that identification-based trust enables ERP usage because it provides a strong signal to users that their organization will consider their interests and goals. Such perception will lead to greater acceptance and use of an ERP system. Hence, we hypothesize that identification will signal higher ERP system usage.

H2e: *Identification positively influences ERP system usage.*

Effect of Organizational Mindfulness on ERP System Usage

Organizational mindfulness concerns management's ability to adaptively deal with unexpected situations. When organizations engage in ERP system adoption, they need to not only understand the system, but also anticipate the challenges that may hinder the assimilation and use of the ERP system. One of a mindful organization's characteristics is its obsession with the possibility of failure and its ability to discern opportunities for realizing value of an IT innovation (Swanson & Ramiller, 2004). Such vigilance in operation can influence how organizational members use and appropriate their ERP system. A non-mindful organization operates from a state of diminished attention that tends to lead to mechanically employing inflexible rule-based behavior and structure (Fiol & O'Connor, 2003). Constrained by pre-existing routines and rigid structure, such organizations easily confuse the stability of their assumptions with stability of the environment, and they thereby erroneously interpret the environment (Langer, 1989; Weick & Sutcliffe, 2003). Consequently, ERP users in such organizations limit their usage to mandatory applications and rarely pursue usages that go beyond their immediate task routine. However, mindful organizations create an atmosphere that fosters innovations and discoveries that can provide the catalyst needed to drive end users to more frequently use and experiment with ERP systems.

ERP systems are notorious for creating new learning curves for assimilating new routines and inherent business processes. However, creating a mindful organization can help assuage both the business process changes and the obstacles that accompany ERP systems. Indeed, mindful organizations will be more equipped to entertain the complexities and conflicts that may arise from an ERP deployment. Such mindful organizations will respond with complex interpretation by relying on internal experts to exploit system potential contributions and by relating to existing operations (Swanson & Ramiller, 2004). Similarly, mindfulness may also help organizations gain value from ERP systems by exploiting ways to maximize benefits and values through continuous improvements (Grabski, Leech, & Schmidt, 2011). This leads to our third hypothesis:

H3: *Organizational Mindfulness positively influences ERP system usage.*

Control Variables

IT adoption and assimilation processes are subject to various other organizational influences (Fichman, 2001). To minimize the confounding effect of spurious correlation, we included firm size, duration of ERP system implementation, and user experience with ERP system as control variables. Firm size is often an important control variable because it has been found to determine firm performance and innovativeness (Kimberly, 1976; Kim & Lee, 2010). Larger organizations can benefit from economies of scale arising from available human capital and financial resources. In addition, the duration, measured by the length of time since the firm implemented the ERP system, was included as a control variable when we tested the effect of organizational trust on organizational mindfulness and ERP system usage.

IV. RESEARCH METHOD

Participants and Procedures

In order to validate the research model, we conducted a questionnaire-based quantitative field study. The sampling frame for this study consists of end users that use ERP systems in their firm's routine task, activities, and business processes. For our sample, we first approached U.S. organizations that have implemented, at minimum, the SAP financial accounting module of an ERP system in their accounting department. In exchange for our promise of a report describing our findings, managers of each firm allowed us to survey one employee in the accounting department that used SAP concerning that individual's routine task and activities. We chose the accounting department because job descriptions for that position tend to be similar from company to company. The samples were randomly chosen from organizations with an SAP version of ERP implementation. We developed a survey instrument to collect the quantitative data required for model and hypothesis testing.

Furthermore, we pilot tested the survey and refined it to make sure that questions were clear and unambiguous. We refined the questionnaire over three iterations by working closely with the pilot group. We then collected data for the study using an online survey, an approach noted for its speed (Dillman, 2007), low cost (Weible & Wallace, 1998), and improved response quality (Paolo, Bonaminio, Gibson, Patridge, & Kallail, 2000). Thus, on behalf of the authors,

from January 2013 until February 2013, 1,450 potential participants were invited to respond to the survey via email with a URL link to the web survey. We also sent out a reminder two weeks after the initial email. We recorded the date of invitation, the date of participation, and the user code to ensure that participants completed the survey only once. In total, we received 231 usable responses, indicating a response rate of 15.9%. Table 1 depicts further details of sample profiles.

Table 1: Sample Characteristics		
	Classification	(%) Respondents
Firm's size (number of employees)	1001 – 5000	13
	5001 – 10000	24.7
	10001 – 50000	26.8
	Above 50000	35.5
Industry	Construction	12.3
	Education	1
	Financial Service	6.1
	Information Technology	7
	Manufacturing	23.5
	Service	29.1
	Telecommunication	3
	Wholesale and Retail	16
Respondent's ERP experience	Other	2
	Less than 1 year	2
	1 – 2 years	16.8
	2 – 3 years	25.6
	3 – 5 years	20.7
Job title of respondents	More than 5 years	34.9
	Accounting Manager	70.2
	Budget Analyst	11.3
Duration of ERP Implementation	Controller	18.5
	1 – 5 years	32.4
	5 – 10 years	33.3
	More than 10 years	34.1

Measurement

Appendix A provides the list of scales and their original sources. Whenever possible, we used previously validated scales and adapted them to the context of ERP system usage. Hatch (2002) notes that existing studies can provide the foundation needed to design an instrument because they afford the ability to recognize gaps in the literature. Overall, the seven-point Likert scale asked respondents to rate their perceptions on organizational trust, organizational mindfulness, and ERP system usage. We distributed Likert-type items for the questionnaire as follows: six items measured organizational mindfulness, three items measured ERP system usage, and 29 items measured the five dimensions of organizational trust. In addition to the focal constructs, we measured the demographic characteristics of each respondent and the duration of the ERP implementation.

V. ANALYSIS AND RESULTS

We analyzed and empirically validated our hypotheses with partial least square (PLS) analysis. We selected PLS because it enables specification and testing of path models with latent constructs. PLS is suited for complex models involving latent variables. In addition, PLS does not require any assumptions of multivariate normality (Chin, Marcolin, & Newsted, 2003), and it works well with small to medium data points (Chin, 1998). PLS deals with



measurement errors in exogenous variables better than other methods, such as multivariate regression (Chin, 1998). Specifically, we used SmartPLS 2.0 (Ringle, Wende, & Will, 2005) for the analysis. SmartPLS 2.0 performs bootstrapping analysis to assess the statistical significance of the loading and of the path coefficients (Ringle et al., 2005). Bootstrapping analysis is a non-parametric approach for estimating the precision of the PLS estimate. Bootstrapping analysis works by re-sampling the original data with replacements to obtain an estimate for each parameter in the PLS model (Chin, 1998, 2001). The hypotheses were supported if the following conditions were met. First, the measurement model should show satisfactory levels of reliability, convergent validity, and discriminant validity. Second, the parameter estimates of the hypothesized structural path should be statistically significant with the hypothesized direction of the effect.

Assessment of Potential Response Bias and Common Method Bias

To ensure that the responses in the sample were free from non-response bias, we split the sample into two groups based on the time that each response was completed. Using this approach, it was possible to determine statistically whether later respondents were significantly different from earlier respondents. The result did not show any significant differences between the two groups, which indicates that non-response bias was not a significant issue that could confound this study's findings.

Because each survey questionnaire was completed by a single respondent, it was important to assess the potential for common method bias. Following Podsakoff and Organ (1986), we conducted the Harman's one-factor test on each organizational trust dimension, organizational mindfulness, and ERP system usage. Results showed that the most covariance explained by one factor was 34.73 percent, which suggests that common method bias was not likely present in the study. In addition, we applied the Liang et al. (2007) procedure to test the common method bias in PLS. The results showed that method loadings were insignificant and that indicators variances were considerably greater than their method variance. Thus, we concluded that the common method bias was not a serious threat to this study.

Measurement Model and Construct Validity

We conducted confirmatory factor analysis (CFA) for all of the latent constructs (Table 2). All item loadings were greater than .60 as recommended by Hair, Anderson, Tatham, and Black (1998). Thus, the items are representative of their respective constructs. We also assessed reliability, convergent validity, and discriminant validity of the measurement models. Acceptable reliability or internal consistency is attained when the Cronbach's alpha and composite reliability are greater than 0.70 (Nunnally, 1978). As Table 3 shows, the composite reliabilities were all above 0.70; thus, all measures have adequate levels of reliability.

Researchers achieve convergent validity when scores of items used to measure a construct correlate with or are related to scores of other items designed to measure the same construct (Campbell & Fiske, 1959). One can assess convergent validity by measuring the reliability of survey items, composite reliability of constructs, average variance extracted (AVE), and factor analysis (Komiak & Benbasat, 2006). As Table 3 shows, all factor loadings were greater than 0.70, the AVE of every latent variable in the research model was greater than 0.70, and they all loaded highly on their own latent variable.

	COEM	COM	ESU	IDEN	OM	OPHO	RELI
COEM1	0.9427	0.552	0.5186	0.5947	0.6383	0.6375	0.6745
COEM2	0.9588	0.5971	0.5599	0.5272	0.6826	0.6899	0.5194
COEM3	0.9401	0.5669	0.5276	0.5085	0.6458	0.6435	0.6898
COEM4	0.9747	0.6222	0.5877	0.5456	0.6978	0.5024	0.4576
COEM5	0.9631	0.6119	0.6376	0.5211	0.6687	0.5689	0.4342
COEM6	0.9468	0.5951	0.5012	0.5017	0.6368	0.6195	0.5014
COEM7	0.9188	0.7097	0.5054	0.5063	0.6479	0.5322	0.5038
COM1	0.3197	0.9909	0.5347	0.6181	0.5002	0.4808	0.5162
COM2	0.3184	0.9952	0.5514	0.5283	0.5027	0.4911	0.5374
COM3	0.2893	0.9942	0.5348	0.5213	0.5923	0.4704	0.5223
COM4	0.2926	0.988	0.5433	0.5155	0.5847	0.4717	0.5256

ESU1	0.3608	0.4301	0.8921	0.4501	0.4501	0.445	0.4706
ESU2	0.4075	0.5299	0.9579	0.5327	0.5473	0.525	0.5144
ESU3	0.4277	0.4937	0.949	0.4504	0.5199	0.5165	0.5217
IDEN1	0.5314	0.5336	0.5775	0.9807	0.5492	0.5419	0.5607
IDEN2	0.5255	0.5272	0.5732	0.9788	0.5479	0.5432	0.5713
IDEN3	0.378	0.4967	0.5317	0.9598	0.5244	0.5281	0.5137
IDEN4	0.402	0.4242	0.4945	0.9483	0.5219	0.5064	0.4708
OM1	0.4117	0.5588	0.5579	0.5529	0.9546	0.5451	0.5286
OM2	0.4432	0.5555	0.5854	0.5624	0.9681	0.5638	0.5649
OM3	0.4026	0.5714	0.5603	0.5334	0.9308	0.5312	0.5427
OM4	0.4497	0.4199	0.5267	0.527	0.9823	0.5538	0.5079
OM5	0.4641	0.3248	0.4595	0.4729	0.9392	0.4968	0.4364
OM6	0.4173	0.2504	0.4032	0.4311	0.8959	0.4547	0.3732
OPHO1	0.5577	0.5732	0.5545	0.5671	0.5659	0.9844	0.5147
OPHO2	0.5653	0.5708	0.5492	0.5594	0.5621	0.978	0.5201
OPHO3	0.5851	0.5484	0.5161	0.5249	0.5329	0.9404	0.5912
OPHO4	0.5848	0.5391	0.5128	0.5922	0.5409	0.9669	0.5829
OPHO5	0.5186	0.5415	0.5192	0.5376	0.5353	0.9625	0.5854
OPHO6	0.5168	0.5478	0.5055	0.5109	0.5318	0.9537	0.4405
OPHO7	0.5829	0.5854	0.5549	0.5385	0.5714	0.989	0.4452
OPHO8	0.5669	0.5596	0.5319	0.5151	0.5497	0.9748	0.4379
OPHO9	0.5669	0.5596	0.5319	0.5151	0.5497	0.9748	0.4379
RELI1	0.5847	0.5586	0.5161	0.3884	0.3834	0.5684	0.938
RELI2	0.5945	0.5081	0.5366	0.3943	0.2106	0.5945	0.943
RELI3	0.5711	0.5564	0.5818	0.5819	0.5757	0.5827	0.9426
RELI4	0.3607	0.5274	0.4703	0.4243	0.5622	0.5699	0.9069

COEM: concern for employees, COM: competence, ESU: ERP system usage IDEN: identity, OM: organizational mindfulness, OPOH: openness and honesty, RELI: reliability.

Discriminant validity examines the extent to which a measure correlates with measures of constructs that are different from the construct the measure is intended to assess (Barclay, Higgins, & Thompson, 1995). It implies that the construct does not share much variance with other constructs, but rather with its own measures. Discriminant validity of the measure is acceptable if the AVE of each construct is greater than the variance among all constructs (Chin, 1998), or if the AVE for each construct is greater than 0.50 and the square root of the AVE for a construct is greater than the correlation of that construct with other constructs (Fornell & Larcker, 1981). This validity is normally demonstrated by showing that the square root of an AVE is greater than the correlations among the construct and all other constructs in the model. Table 3 presents the correlation matrix among all constructs, and shows that the square root of an AVE of each construct is greater than the correlations between the construct and all other constructs. Thus, the measurements demonstrate satisfactory levels of discriminant validity.

Table 3: Descriptive statistics, validity and reliability

	Mean	SD	AVE	CR	α	COM	OPHO	COEM	RELI	IDEN	OM	ESU
COM	3.75	1.02	0.984	0.996	0.995	0.992						
OPHO	4.392	1.13	0.939	0.993	0.992	*0.485	0.969					
COEM	4.065	1.08	0.901	0.985	0.982	*0.410	*0.479	0.949				

RELI	4.781	1.24	0.87	0.964	0.95	*0.532	*0.542	*0.434	0.932			
IDEN	4.707	1.34	0.935	0.983	0.977	*0.526	*0.561	*0.437	*0.561	0.967		
OM	4.467	1.06	0.894	0.981	0.976	*0.502	*0.578	*0.486	*0.547	*0.567	0.945	
ESU	4.558	1.21	0.871	0.953	0.926	*0.548	*0.560	*0.456	*0.566	*0.577	*0.571	0.933

Note: Square roots of AVE figure are shown in bold along the diagonal. *Indicates significant at $p < 0.05$

Structural Model Testing

H1a-e concern the effect of organizational trust dimensions on organizational mindfulness. H1a states that competence positively affects organizational mindfulness. The results show a significant positive relationship between competence and organizational mindfulness. As such, this hypothesis was supported ($\beta = 0.15, p < 0.01$). Similarly, H1b states that openness and honesty have a positive effect on organizational mindfulness. This hypothesis was also supported ($\beta = 0.49, p < 0.01$). H1c states that concern for employees positively affects organizational mindfulness. This hypothesis received support ($\beta = 0.17, p < 0.01$). Contrary to H1d, reliability was not a significant predictor of organizational mindfulness ($\beta = -0.04, p > 0.10$). H1e states that identification positively influences organizational mindfulness. The result shows a path coefficient of 0.26 between identification and organizational mindfulness. Thus, the hypothesis was supported ($\beta = 0.26, p < 0.01$).

H2a-e concern the effect of organizational trust dimensions on ERP system usage. H2a states that competence positively influences ERP system usage. The result shows a significant positive relationship between competence and ERP system usage. As such, this hypothesis was supported ($\beta = 0.35, p < 0.01$). Contrary to H2b, openness and honesty were not significant predictors of ERP system usage. This hypothesis was not supported ($\beta = 0.04, p > 0.10$). H2c states that employees positively influence ERP system usage. This hypothesis was supported ($\beta = 0.15, p < 0.01$). However, H2d states that reliability positively influences ERP system usage, but it was not supported ($\beta = 0.07, p > 0.10$). H2e states that identification positively influences ERP system usage. The result shows a significant positive relationship between identification and ERP system usage. As such, this hypothesis was supported ($\beta = 0.28, p < 0.01$).

Finally, H3 states that organizational mindfulness positively influences ERP system usage. The results show that organizational mindfulness has a significant positive effect on ERP system usage. As such, this hypothesis was supported ($\beta = 0.15, p < 0.01$). Furthermore, our assessment of the coefficient of determination (R^2) indicates that the hypothesized effect contributes substantially to the explanatory power of our research model. The R^2 scores for the dependent variables in the model were 47.3 for organizational mindfulness and 58.2 for ERP system usage. We summarize the results in Table 4 and Figure 2.

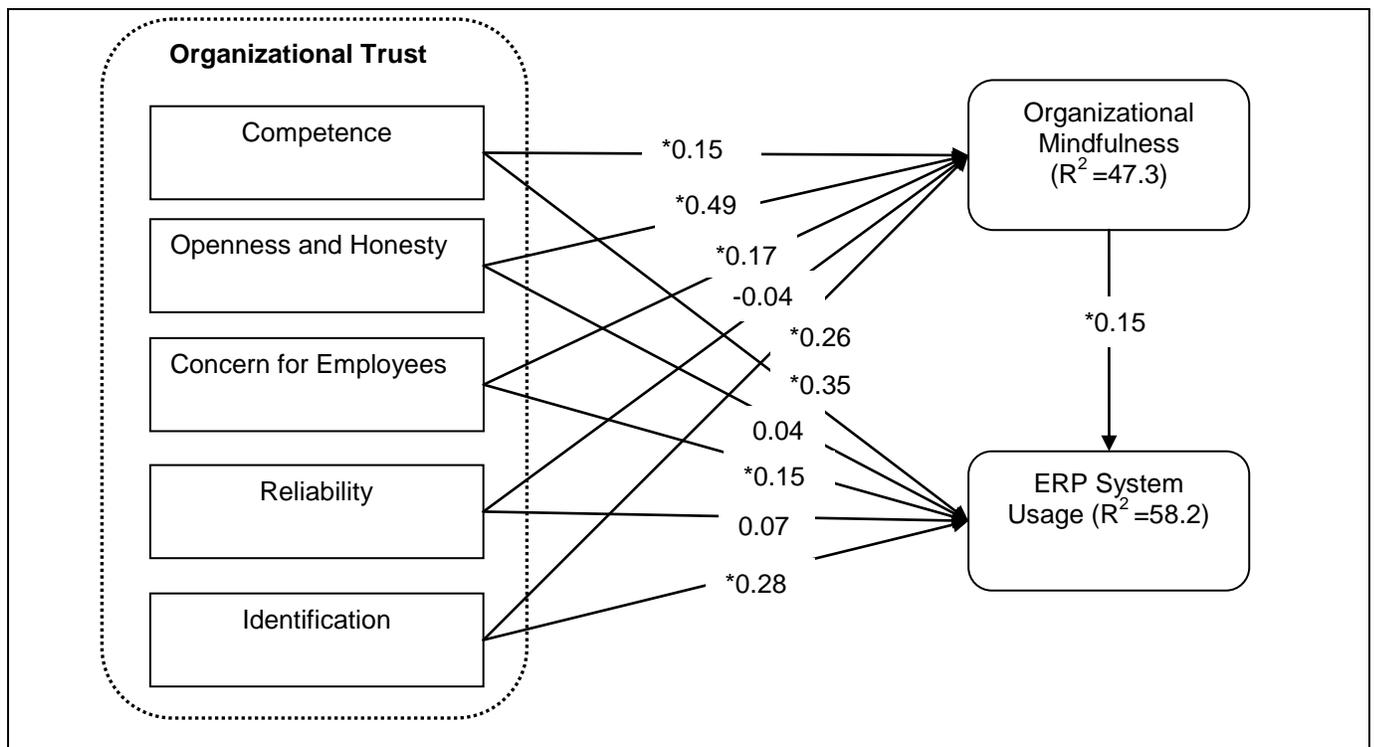




Figure 2. Research Model with Results (* indicate Significant Relationships)

Table 4: Summary Hypotheses Testing Results						
	Independent variable	Effect	Dependent variable	Estimate	t-value	Results
H1a	Competence	→	Organizational mindfulness	0.149	3.936	Supported
H1b	Openness and honesty	→	Organizational mindfulness	0.493	7.235	Supported
H1c	Concern for employees	→	Organizational mindfulness	0.17	5.979	Supported
H1d	Reliability	→	Organizational mindfulness	-0.046	1.122	Not supported
H1e	Identification	→	Organizational mindfulness	0.258	6.029	Supported
H2a	Competence	→	ERP system usage	0.35	8.798	Supported
H2b	Openness and honesty	→	ERP system usage	0.041	0.759	Not supported
H2c	Concern for employees	→	ERP system usage	0.149	8.169	Supported
H2d	Reliability	→	ERP system usage	0.068	1.217	Not supported
H2e	Identification	→	ERP system usage	0.28	5.523	Supported
H3	Organizational mindfulness	→	ERP system usage	0.149	2.341	Supported

VI. DISCUSSION

In general, the results support eight of the eleven hypotheses (see Table 4) and suggest that organizational mindfulness and organizational trust dimensions (namely, competence, concern for employees, and identification) are important enablers of ERP system usage. Furthermore, the study provides the rationale for viewing organizational trust dimensions as critical drivers of ERP system usage and organizational ability to develop mindfulness among its employees. Our results emphasize that competence, as defined by how strongly one believes that their organization will compete and survive in the business environment, is a key driver of organizational mindfulness and ERP system usage. One reason for this is that competence creates a perception of proficiency in organizational leadership and thus fosters the willingness to embrace new challenges and the ability to navigate through the learning curves created by ERP systems. The perception of competence in an organization will reinforce the conviction among employees and spark the desire to act and adapt to changing conditions and practices, which drives organizational mindfulness and ERP system usage.

In addition, we found openness and honesty to be important enablers to organizational mindfulness. One of the key characteristics of a mindful organization is the ability to capture details about emerging threats and the aptitude to create the capability to promptly act on these details (Weick et al., 1999). However, such details about emerging threats can be acted on only if employees perceive the organization to be open, honest, and sincere with its communications. Thus, the perception of sincerity of communication among members is an important driver of organizational mindfulness. Indeed, organizational members can undermine or ignore details about emerging threats if they doubt the veracity of the information. Contrary to our hypothesis, openness and honesty did not have a significant effect on ERP system usage. We believe that this lack of significance in the relationship between openness and honesty and ERP system usage is an important finding because it suggests that organizations with

sincere and appropriate information communication may yet be hindered by the complexity associated with using an ERP system.

Another possibility is that, although openness and honesty signal more trust and better communication among organizational members, they have an indirect effect on ERP system usage. More specifically, when employees communicate with their organizational leadership to discuss their ideas and concerns, the leadership needs to gather all their input, study it, and create a strategy on how to respond. Thus, employees might not observe a direct outcome given the processes involved. Further research in this area may provide a better explanation.

Moreover, the results indicate a significant effect between concern for employees and organizational mindfulness. An organization's ability to express concern and empathy contributes to high trust levels among its employees (Ellis & Shockley-Zalabak, 2001). Such trust levels can assist in building organizational mindfulness. Organizational leaders expressing concern and empathy to employees can help institutionalize a culture that inspires mindfulness. Expressing concern for employees can help build the trust level necessary for organizational mindfulness. Moreover, employees' ability to perceive acts of empathy and tolerance can help nurture desire and determination to navigate conditions of high complexity and uncertainty. We found concern for employees to have a positive effect on ERP system usage. This finding is particularly interesting because it shows that employees are willing to explore and embrace the learning curves associated with an ERP system usage as long as they have confidence in the organizational leadership's ability to empathize and understand their concerns.

Contrary to our hypotheses, reliability-based trust as determined by whether co-workers, teams, and organizations act in a consistent and dependable manner (Ellis & Shockley-Zalabak, 2001) had no effect on either organizational mindfulness or ERP system usage. One possible explanation could be related to the very nature of organizational mindfulness that involves capturing emerging threats, questioning the adequacy of existing assumptions, and creating the capacity to act swiftly. Such characteristics may not be fostered by a firm's ability to act in a consistent and reliable manner as such threats emerge. Further investigation is warranted in order to explore this finding.

Consistent with our hypothesis, our results indicate that identification (as defined by how employees and individuals in an organization hold the norms, values, and beliefs associated with the organizational culture) significantly affects organizational mindfulness. From a managerial standpoint, it might be beneficial for organizations to create a structure that nurtures organizational identity, norms, and values prior to striving to become a mindful organization. Our study suggests that how individuals and employees identify with their organization remains a key determinant in creating a mindful organization. Accordingly, identification had a positive effect on ERP system usage. This finding is important because it shows that having employees that share the values and norms of the organization can help drive the willingness to embrace and use new complex technologies such as an ERP system.

Our results indicate a strong effect between organizational mindfulness and ERP system usage. This finding is consistent with Swanson and Ramiller (2004), who argue that mindful organizations are resilient and adaptive to problems encountered with process changes during ERP implementation. When a firm creates an environment for rich and context-specific learning, ERP users may be more positioned to embrace and explore complex functionalities embedded in an ERP system.

Implications for research and practice

This study makes key contributions to theory and practice. As we note in Section 1, although significant research attention has been directed at understanding ERP system adoption and critical success factors of ERP implementation, very little attention has been paid to organizational trust and how it can help support ERP system usage. This is a significant gap in the literature because ERP system usage in part determines if and how organizations realize the benefits and potentials of their ERP system. With this study, we help to fill this gap by examining the effects of organizational trust and organizational mindfulness on ERP system usage. We provide insight into the specific interplay between organizational trust and organizational mindfulness as predictors of ERP system usage. The empirical results hold important implications for future research that seeks to reconcile the influence of organizational trust on the use and appropriations of complex technologies such as ERP systems. Furthermore, our findings make an important contribution to existing literature on organizational trust and mindfulness (see, for e.g., Chughtai & Buckley, 2007; Fichman, 2004; Swanson & Ramiller, 2004; Tan & Tan, 2000) by highlighting their effect on system usage and by developing a richer understanding on the positive influence of mindfulness on trust. Additionally, an important theoretical implication concerns the added power to explain system usage as a result of organizational trust and organizational mindfulness.

This study shows key antecedents of organizational mindfulness that prior studies have largely ignored. Although prior research has demonstrated the importance of organizational mindfulness in IT innovation models (Swanson & Ramiller, 2004), less is known about the antecedent, especially as it relates to ERP system usage. Building on the

idea that organizational mindfulness can inspire prompt response to emerging threats and opportunities (Weick & Sutcliffe, 2001), this study develops and tests a more nuanced model of ERP system usage. The empirical evidence presented in this study directly supports the contention that organizational mindfulness is an important predictor of ERP system usage. This finding is particularly interesting because it suggests that, while an ERP system may contain a pre-defined process framework, the process of obtaining optimal ERP benefits and values may reside in mindful user's ability to discover unique ways to align the systems with task routines. It is not just the IT system, but also the characteristics of users shaped by organizational mindfulness that influence ERP usage. Thus, this study can provide a revealing theoretical lens for further understanding of key antecedents and factors that drive organizational mindfulness and usage respectively in an ERP system environment. The finding integrates organizational trust and organizational mindfulness into one model that explains ERP usage. In this study, we show that ERP usage may be inhibited by such organizational imperatives as competence, openness and honesty, identification, and the firm's mindfulness. This model helps enrich the understanding of ERP use.

This study should be of practical importance to managers and executives who seek to maximize the benefits and the potentials of their ERP systems. For managers and executives, the study shows that the key to capturing the full use of their organizations' ERP system may reside in the ability to create a culture that fosters organizational trust and mindfulness. Based on this study, managers can understand that, by their nurturing a culture that fosters organizational trust, the organization's users may be better equipped to use the ERP system. More specifically, as firm management demonstrates their proficiency in solving problems and delivering desired results, shows concern for the ongoing needs and welfare of their employees, and shares the norms, values, and beliefs associated with the organizational culture, higher levels of trust will develop among their employees and ultimately lead to greater system usage. Thus, developing and fostering an atmosphere of organizational trust with ERP users may help reduce the barriers associated with ERP system use. If employees have a shared sense of understanding of why an ERP system is best suited for the business process, they will be more likely to effectively assimilate and apply it accordingly. In addition, practitioners should be aware of the key drivers of organizational mindfulness in the ERP system environment. Particularly, when management shows competence, communicates openly and honestly with employees, displays concern, and identifies with the organizational culture, this leads to mindfulness. So, by encouraging innovation and creating an environment where mistakes are opportunities to learn, employees will start to trust their management and feel encouraged to innovate and to think outside the box. Thus, it may be more efficient for organizations to consider policies and organizational structures that advance organizational trust and mindfulness.

Limitations and Future Research

Although we believe that our study makes a number of contributions, like all other research studies, it too has some limitations, one of which is in the sample size. Although the questionnaire went to 1,450 ERP system users, only 248 responded by filling in the survey. Out of these 248 responses, only 231 were complete and useful for analysis. Although the existing sample seems adequate for this study, a higher response rate would have added more validity and generalizability. Another limitation of this study stems from the fact that it adopts a cross-sectional view in measuring constructs. Such a design may not adequately capture the interaction between the task routine and the knowledge and skills required to execute the task. Although this study examines key variables using perceptual measures, we believe that prior history of the organization was controlled for and was factored into these perceptions and, thus, does not taint the findings. Future research might find it useful to measure these variables from multiple points in time. Thus, a longitudinal study may enrich the findings of our results and offer additional perspectives on the constructs. Finally, another limitation is that the survey included one accounting employee per firm. Moreover, the majority of these employees held a managerial position in the accounting department. The type of our respondents and their positions in the organization can introduce bias. Thus, our findings may not be generalizable to all kinds of ERP system users.

VII. CONCLUSION

This paper examines the implications of organizational trust and organizational mindfulness on ERP system usage. It explores how key dimensions of organizational trust and organizational mindfulness influence ERP system usage. The results from the empirical evidence show that competence, openness and honesty, concern for employees, and identification positively influence organizational mindfulness. This means that firm management can increase organizational mindfulness among ERP system users by creating processes and structures that are capable of driving organizational trust among their users. In addition, our results suggest that organizational mindfulness is a key predictor of ERP system usage. This means that, in a bid to increase ERP system usage in organizations, organizations need to create a foundation that breeds and entertains novelty, diversity, and conflicting perspectives.

The results further show that organizational trust dimensions (namely, competence, concern for employees, and identification) can inspire increased usage among ERP system users. This is important because, while earlier IS

researchers have identified top management support as an important element in the successful implementation of an ERP system, our study shows that organizational trust can indeed influence ERP system usage and organizational mindfulness. As managers continue to grapple with the changes associated with ERP adoption, building organizational trust among employees can provide a remedy that can inspire usage among ERP system users.

In addition, although the literature identifies ERP system usage problems, how they can be influenced by organizational imperatives was not clear (Boudreau & Robey 2001; Amoako-Gyampah & Salam, 2004). We simultaneously consider organizational trust and mindfulness as components of organizational dynamics and our framework provides alternative explanations to ERP system usage. This is a more comprehensive approach and a departure from the unidimensional view applied in some existing studies that seek to understand ERP usage (Liang et al., 2007; Park et al., 2007).

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APPENDIX A: MEASURES

Organizational mindfulness (Weick & Sutcliffe, 2001)

1. People are encouraged to question the way things are usually done here.
2. Personnel here are willing to challenge the status quo.
3. We appreciate skepticism here.
4. People feel free to prolong their analysis to better grasp nature of problems.
5. We have a good map of each other's talents and skills.
6. People are committed to solving any problem that arises.

ERP system usage

1. I use the ERP system installed in my organization very intensively to support my work (Schwarz, 2003).
2. I use the ERP system installed in my organization very frequently to support my work (Schwarz, 2003).
3. Overall, I use the ERP system a lot (Chang et al., 2008).

Organizational trust dimension instruments (Shockley-Zalabak, Ellis, & Cesaria, 1999; Ellis & Shockley-Zalabak, 2001)

Competence

1. I am highly satisfied with the organization's overall efficiency of operation.
2. I am highly satisfied with the overall quality of the product and/or service of the organization.
3. I am highly satisfied with the capacity of the organization to achieve its objectives.
4. I am highly satisfied with the capacity of the organization's employees.

Openness/honesty

1. I can tell my immediate supervisor when things are going wrong.
2. I am free to disagree with my immediate supervisor.
3. I have a say in decisions that affect my job.
4. My immediate supervisor keeps confidences.
5. I receive adequate information regarding how well I am doing in my job.
6. I receive adequate information regarding how I am being evaluated.
7. I receive adequate information regarding how my job-related problems are handled.
8. I receive adequate information regarding how organization decisions are made that affect my job.
9. I receive adequate information regarding the long-term strategies of my organization.

Concern for employees

1. My immediate supervisor listens to me
2. Top management is sincere in their efforts to communicate with employees.
3. Top management listens to employees' concerns.
4. My immediate supervisor is concerned about my personal well being.
5. Top management is concerned about employees' well being.
6. My immediate supervisor is sincere in his/her effort to communicate with team members.
7. My immediate supervisor speaks positively about subordinates in front of others.

Reliability

1. My immediate supervisor follows through with what he/she says.
2. My immediate supervisor behaves in a consistent manner from day to day.
3. Top management keeps their commitments to employees.
4. My immediate supervisor keeps his/her commitments to team members.

Identification

1. I feel connected to my peers.
2. I feel connected to my organization.
3. I feel connected to my immediate supervisor.
4. My values are similar to the values of my peers.
5. My values are similar to the values of my immediate supervisor.



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