Who is Out There? Exploring the Effects of Trust and Perceived Risk on Saas Adoption Intentions

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Abstract

Software as a Service (SaaS) is a relatively new organizational application sourcing alternative, offering organizations the option to access applications—via the Internet—that are remotely hosted on offsite servers instead of installing equivalent applications in-house, thus presumably saving costs. Although SaaS has been offered since the late 1990s, so far it has not become a dominant sourcing alternative for organizational core applications, in spite of the fact that most leading IT companies now offer remotely-hosted organization-wide applications. This study conceptualized and empirically tested a model of the effects of the perceived risk of SaaS and trust in the SaaS vendor community on the organizational intention to adopt SaaS at this early stage of the SaaS market. Three novel, risk-related constructs were developed: perceived risk of SaaS, perceived risk of systems unavailability, and perceived risk of data insecurity. Likewise, three new trust-related constructs were also conceived: trust in the SaaS vendor community, perceived capabilities and perceived reputation of the SaaS vendor community. An empirical test of the model demonstrated the negative effect of perceived risk and the positive effects of trust in, and the reputation of, the SaaS vendor community, on the intention to adopt SaaS. Trust in the SaaS vendor community was also found to strongly affect all three risk concepts.

ACM Categories: D.2.11. Software architectures.

Keywords: Software as a Service, trust, perceived capabilities, perceived reputation, perceived risk, intention to adopt

Introduction and Background

Software as a Service (SaaS) is a B2B transaction that facilitates the provision of centrally-located IT services by a vendor via either a rental or lease agreement (Lockett et al., 2006). Thus, SaaS customers are charged usage fees for remotely accessing applications and databases that reside on vendor-owned servers (Gupta and Herath, 2005; Susarla et al., 2003). SaaS was first introduced in the late 1990s under the name Application Service Provision (ASP), and is now also termed software on demand.[1] Designed to reduce IT cost and improve IT performance, SaaS functionality is similar to that

[1] The term ASP was exchanged for SaaS after the dot-com collapse, when vendors started re-introducing this sourcing option as of 2002-2003. Hence the two terms relate to the same concept.

of service bureaus in the 1960s, downsizing in the 1980s, and outsourcing in the 1990s (Currie and Seltsikas, 2001; Henderson and Venkatraman, 1993; Loh and Venkatraman, 1992). The perceived business value of SaaS and the reduction in IT cost associated with using it have thus been cited as the main drivers of SaaS adoption (Currie et al., 2004a; Kern et al., 2002a), and the perceived risks and uncertainties connected with SaaS are seen as inhibitors (Smith and Rupp, 2002; Susarla et al., 2003).

The critical decision of whether to adopt SaaS in an organization presents a variety of risks for several reasons, above and beyond those encountered with the use of bespoke or pre-packaged applications. First, similar to traditional IT outsourcing, it involves major changes in organizational IT governance. This often renders employee unrest and resistance. Second, also like IT outsourcing, the organization becomes more heavily dependent on a vendor, which is particularly worrying when core applications are at stake.[2] And third, unlike IT outsourcing, SaaS entails moving organizational applications and data outside the customer's boundaries to the vendor's servers, from where it can be accessed over a wide area network, usually the Internet. Prior research has identified this last aspect of SaaS as a major impediment to its adoption (Currie et al., 2004b; Ekanayaka et al., 2003; Heart and Pliskin, 2001). The risks of adopting SaaS are elaborated upon later in the paper.

Most pioneering SaaS vendors did not survive the dot-com collapse (Currie et al., 2004b; Currie, 2004). Nonetheless, vendors such as Salesforce.com have recently - and successfully - re-embraced the SaaS concept.[3] Furthermore, Oracle and IBM have lately established SaaS (preferring the "on demand" designation) as an important line of business, and SAP launched its new package Business ByDesign primarily as SaaS.[4] Evidently, although the full potential of SaaS has not been realized and its institutionalization has yet to be seen, the Web is now more strongly recognized as a valid IT delivery platform (Carr, 2005; Mustonen-Ollila and Lyytinen, 2004), albeit less so for delivering core, organization-wide applications (Gupta and Herath, 2005; Lockett et al., 2006). SaaS adoption requires major changes in organizational IT governance, especially when it involves replacing existing core applications. Therefore, based on Swanson's (1994) typology of IT innovation, SaaS should be classified as a type III innovation, because when core applications are involved, it is focused in the organizational technical core, where the production processes take place. Hence, this type of IT innovation strongly affects the whole organization (Swanson, 1994).

Trust has been long regarded as the foundation of the economy and as a primary enabler of economic partnership (Ba and Pavlou, 2002; Bahmanziari et al., 2003; Bensaou, 1997; Bunduchi, 2005; Chiles and McMackin, 1996; Davies and Prince, 2005; Dyer and Chu, 2003; Ganesan, 1994; Hart and Saunders, 1997; Jarvenpaa et al., 2004; Lim et al., 2006; Mayer et al., 1995; Pavlou and Gefen, 2004; Sako and Helper, 1998; Wing and Angie, 2006; Zand, 1972; Zucker, 1986). While generally true, trust is particularly important when risks and uncertainties dominate the transaction climate, as is the case at the inception of most business relationships (Bensaou, 1997; Luhmann, 1979; Nicolaou and McKnight, 2006). With the increasing prevalence of online business since the 1990s, trust has been established as a crucial factor for transacting online for both B2C (Ba and Pavlou, 2002; Einwiller, 2003; Gefen, 2000; Gefen and Heart, 2006) and B2B e-commerce (Dyer and Chu, 2003; Franke et al., 2005; Grossman, 2004; Hart and Saunders, 1997).

While trust in an online vendor is complex, the initial trust required during the early stages of the transaction decision is of particular interest when the buyer is inexperienced and when the type of transaction is new. At this early stage of the product life cycle, traditional types of trust beliefs that are based on prior experience, knowledge, or familiarity with the vendor (McKnight and Chervany, 2001) do not yet exist. Likewise, when the transaction is new therefore the market is immature, as is SaaS, environmental supporting signals and cues are also scarce. Prior research suggests *trust in an online vendor community* as a new, institution-based trust belief that drives the intention to transact at the inception stage, prior to partnering with a specific seller (Pavlou and Gefen, 2004; Pavlou, 2002). Hence, the present study explores this type of trust belief, its interaction with the perceived risk of the Internet, and their mutual effects on the intention to adopt SaaS.

The failure of the first SaaS generation (Currie, 2004) and the recent re-emergence of SaaS motivated this investigation of trust beliefs and of the

[2] Contradicting traditional managerial theories (i.e, (Applegate et al., 1999)), core applications are more often being outsourced. See, for example, (Ekanayaka et al., 2002)

[3] http://www.salesforce.com/customers/

[4] http://www-306.ibm.com/e-business/ondemand/us/howtogeton/howtogeton.shtml; http://www.saphosting.com/services/hosting_services.asp; http://blogs.zdnet.com/BTL/?p=4903;

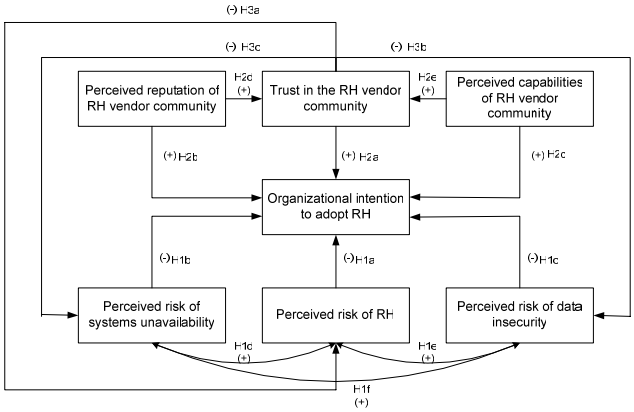
perceived risk that dominate the atmosphere around SaaS adoption intentions (Gupta and Herath, 2005). The impacts of perceived risk and of trust on the intention to adopt SaaS are important because SaaS adoption, as an organization-wide, IT-driven innovation, is a risky move (Heart and Pliskin, 2002a; Paraskevas and Buhalis, 2002) that requires a certain amount of trust to make the leap of faith. Although the effects of risk and trust on organizational intention to opt for B2B have been discussed (Zaheer et al., 1998), Nicolaou and McKnight (2006) maintain that only infrequently are both issues included in the discussion. Furthermore, this study focuses on a specific trust belief - trust in a vendor community - that was only recently conceptualized, and as such, it has not been thoroughly investigated (Pavlou and Gefen, 2004). By revisiting and extending this relatively new trust belief, the present study addresses previous calls to go beyond the dyadic buyer-seller trust beliefs for both the individual and organizational levels of analysis (Pavlou, 2002; Pavlou and Gefen, 2005; Zaheer et al., 1998). In this regard, the present study attempts to answer the following research questions: 1) What are the impacts of the three types of trust and of perceived risk on the intention to adopt SaaS? 2) What are the relationships between these trust beliefs and perceived risk of SaaS? To answer these questions, a model was developed and empirically tested using a field survey. Conceptualizations from Transaction Cost Economics (TCE) and from trust-related theories underlie the model's hypotheses.

The rest of the paper is structured as follows: drawing upon the literature, the research model is presented and the hypotheses are developed. The research methodology and results are then described, concluding with a discussion of the study's contributions and its implications for research and practice.

Literature Review and Research Model

The research model is based on the hypotheses that the organizational intention to adopt SaaS is directly affected by factors reflecting three types of trust in the SaaS vendor community and three types of perceived risk that are inherent in SaaS (Figure 1). While not exhaustive, these two blocks of determinants are hypothesized to span a significant portion of the variability in the organizational intention to adopt SaaS. Although prior research acknowledge the effects of other factors, for example organizational and technological issues (Chwelos et al., 2001; Iacovou et al., 1995; Khalifa, 2006; King et al., 1994; Seligman, 2006; Son and Benbasat, 2007; Swanson and Ramiller, 1997; Tornatzky and Fleischer, 1990; Yao et al., 2002; Zhu and Kraemer, 2005), this study focuses on risk and trust because of their posited dominant impacts during the initial stage of intention formation. According to Bensaou (1997), these constructs reflect the "climate of the relationship," which is "the most robust predictor" of buyer-supplier cooperation (Bensaou, 1997, p. 118).

Figure 1: Research Model



Organizational Intention to Adopt SaaS

Organizational intention to adopt SaaS is defined as the degree to which an organization favorably considers adopting SaaS in the near future. Usually, senior management gives the final authorization to adopt SaaS, but the road to full assimilation and use may still be long (King et al., 1994; Ravichandran, 2005). Positive intentions, though, are clearly a mandatory, albeit insufficient, condition for actual, eventual use.

Initially defined at the individual level of analysis, intention has also been applied at the organizational level (Chwelos et al., 2001; Nicolaou and McKnight, 2006; Zhu and Kraemer, 2005; Zhu et al., 2003). Arguably, since organizational actions are driven by individuals, intention stems from, and is a reflection of, the summation of attitudes of the organization's leaders (Khalifa, 2006). In other words, organizational sense-making pertaining to the "critical reception" (Ramiller and Swanson, 2003, p. 22) of a disruptive process, such as SaaS adoption, is clearly driven by the cumulative cognitions of a team of influential, organizational actors (Seligman, 2006; Swanson and Ramiller, 1997; Zaheer et al., 1998).

Perceived Risk of SaaS

The role of risk in organization strategy has traditionally been discussed in terms of its effect on performance (Scott, 2004). Since risk is difficult to objectively quantify, researchers have frequently used perceived risk, or "the subjective probability of suffering a loss in pursuit of desired outcome" (Pavlou, 2002 , p. 225). Thus, the perceived risk of SaaS is defined as the subjective manner in which organizational members collectively assess the probability of suffering losses, particularly those brought about by the Internet, as a result of SaaS adoption.

There is strong theoretical and empirical evidence that, at the individual and organizational levels of analysis, perceived risk negatively affects the intention to adopt (Currie, 2003; Kern et al., 2002b; Nicolaou and McKnight, 2006; Patnasingam et al., 2005; Pavlou and Gefen, 2004; Ravichandran, 2005). Based on Transaction Cost Economics, risk perceptions increase transaction costs because they imply the need to implement costly and complex risk mitigation measures (Chiles and McMackin, 1996; Nicolaou and McKnight, 2006; Williamson, 1979). Organizational, relational, and environmental risks are all associated with B2B transactions (Bensaou, 1997; Scott, 2004).

Organizational risks stem from the effects that major changes - manifested, for example, in the level of disruption and discontinuity - can have on the adopting organization. Such risks, although important (Swanson and Ramiller, 1997; Swanson, 1994), are beyond the scope of this paper. Nonetheless, they are briefly mentioned during the discussion on trust in the SaaS vendor community. Similarly, because relational risks stem from the characteristics of the specific partner, they are also discussed in the section dealing with trust.

Environmental risks are those associated with transacting over the web, which is technologically unpredictable (Bensaou, 1997) due to the unstable and risky nature of the Internet (Ratnasingam, 2002). Although there are objective measures to quantify Internet risks, Chellappa and Pavlou (2002) argue that a gap exists between expert assessments of the level of security and the public perception of the situation. But because the latter affects intention to adopt, subjective risk perceptions are important. Although the potential environmental risks associated with Internet-based transactions are discussed extensively in the professional literature (Greenemeier, 2007), they are more scantly researched in the B2B adoption context (Bensaou, 1997; Nicolaou and McKnight, 2006; Ratnasingam, 2007). While most such environmental hazards of Web-based transactions are conceptualized as risks, Ratnasingam (2002) defines a similar concept as "technology trust," arguing that it incorporates the institution-based trust that arises from adherence to technological standards and protection mechanisms. Research shows, however, that both concepts acknowledge the increase in perceived risk inherent in transacting over the Internet, which in turn is a limiting factor to adoption (Ratnasingam, 2007). Hence,

Hypothesis H1a: Perceived risk of SaaS technology negatively affects organizational intention to adopt SaaS.

Perceived Risk of Systems Unavailability

Perceived risk of systems unavailability is defined as the subjective belief organizational members use to collectively assess whether their organization's IT may become unavailable as a result of transacting over the Internet. Network instability or malicious attacks on organizational systems may cause systems to become unavailable. In both cases, systems unavailability threats entail substantial financial losses when strategic IT is at stake. Clearly, expectations that SaaS may jeopardize systems availability enhance transaction costs, thereby decreasing the positive intention to adopt SaaS (Gupta and Herath, 2005; Paraskevas and Buhalis, 2002). Hence,

Hypothesis H1b: Perceived risk of systems unavailability as a result of transacting over the Internet negatively affects organizational intention to adopt SaaS.

Perceived Risk of Data Insecurity

Perceived risk of data insecurity is defined as the subjective belief organizational members use to collectively assess whether data is at risk as a result of hosting the data remotely and of transacting over the Internet. A recent survey conducted by Accenture for Information Week revealed that data security is a greater threat than malicious attacks or viruses to organizational IT (Greenemeier, 2007). In both B2C and B2B studies, perceived data insecurity was found to be a strong determinant of overall risk (Chellappa and Pavlou, 2002; Nicolaou and McKnight, 2006). Whereas transacting over the Internet is perceived as risky by itself, the storage of organizational data on remote servers shared by other SaaS customers, some of whom are often competitors, adds another source of concern (Heart

et al., 2007). Indeed, perceived risk of data insecurity has been documented as a primary barrier to first-generation SaaS adoption (Kern et al., 2002b; Paraskevas and Buhalis, 2002; Susarla et al., 2003; Tao, 2001). Similar to perceived risk of systems unavailability, this type of risk perception not only enhances the negative probability of achieving the expected results of SaaS engagement, it also increases transaction costs because of the need to install costly counteraction measures. Hence,

Hypothesis H1c: Perceived risk of data insecurity as a result of transacting over the Internet negatively affects organizational intention to adopt SaaS.

Because all three types of risk are subjective, their assessments should be related to one's personal propensity to perceive SaaS as more or less risky. Therefore, it is posited that informants who see the SaaS environment as less secure would have stronger risk perceptions, whereas those who perceive the SaaS environment as less risky would have a more lenient risk assessment. This should result in positive correlations among all three types of perceived risk. Hence,

Hypothesis H1d: Perceived risk of SaaS and perceived risk of systems unavailability are positively correlated.

Hypothesis H1e: Perceived risk of SaaS and perceived risk of data insecurity are positively correlated.

Hypothesis H1f: Perceived risk of data insecurity and perceived risk of systems unavailability are positively correlated.

Trust in the SaaS Vendor Community

The importance of trust in the conduct of individual and organizational affairs has been accepted by cross-disciplinary research (Hosmer, 1995; Luhmann, 1979; Zucker, 1986), including the IT stream (for reviews see for example Ba and Pavlou, 2002; Gefen, 2004; Pavlou and Gefen, 2004). In particular, trust has been established as a crucial enabling factor in relations where there is uncertainty, interdependence, and a wariness of opportunism (Chiles and McMackin, 1996; Gefen, 2002). Generally—and specifically in these situations—trust is strongly linked to confidence in, and overall optimism about, the desirable consequences that could result from the transaction (Cropanzano and Mitchell, 2005; Gefen, 2002; Gefen et al., 2003; McKnight et al., 1998; Shapiro, 1987; Zucker, 1986). Trust is generally based on a subjective evaluation that is undertaken when the potential damage to the trustor exceeds the potential gains, as can occur if the trustee does not act in an expected, trustworthy manner. From the TCE point of view, trust is important because choosing a trustworthy partner decreases transaction costs by reducing the need for controls that are not only costly, but that also tend to inhibit innovation and cooperation (Williamson, 1985). Psychologically, trust was shown to enable the "leap of faith" required for forming positive intentions to engage, in spite of whatever uncertainties and risks may still be associated with the engagement (Dyer and Chu, 2003; Hosmer, 1995). While there is unanimous agreement that trust is critical in all risky interactions (Kumar, 1996), its crucial role in facilitating e-commerce transactions is now widely accepted, to the point that lack of trust is cited as the number one barrier to Internet transacting (Hart and Saunders, 1997; Karpinski, 2000; Kim and Benbast, 2003). This is also valid for adoption of SaaS, which is a type of B2B engagement.

Trust has also been established as an important enabler of inter-organizational collaboration, particularly at the inception of the relationships when the role of trust is important because "the beginning of any relationship is its most tenuous and uncertain timeframe" (Zaheer et al., 1998`, p. 333). As in inter-personal relations (Lim et al., 2006), only the required amount of trust relative to the perceived risks drives positive intentions to conduct business with another organization (Gefen, 2004). In contrast, a lack of trust, and the high probability for negative outcomes its absence implies, would clearly result in the early rejection of the transaction altogether (Karpinski, 2000; Koller, 1988; Scott, 2004).

While prior research elaborated on inter-organizational trust when the trustor organization knows the trustee and can evaluate its trustworthiness (Gefen, 2004; Nicolaou and McKnight, 2006), a less researched question addresses the type of trust that can be administered at an earlier stage of the evaluation process, when the intention is still an idea or an alternative to be considered, and even before a partner has been selected. This may be the case when, for example, an organization evaluates SaaS adoption as a strategic move. Arguably, at that stage, the development of process-, characteristic-, or institution-based trust beliefs (Gefen, 2004; Zucker, 1986)[5] should be difficult because the novelty of

[5] Zucker (1986) developed these three types of trust: process-based trust is based on prior positive experience with the process underlying the

SaaS precludes the existence of prior experience, acquaintance, and institutional reassurances. Hence, extending Pavlou and Gefen (2004) and Pavlou (2002), trust in the SaaS vendor community is posited as the trust belief that dominates the early stage of the SaaS intention formation, before a partner has been selected. In such an environment, beliefs that reputable, capable, and trustworthy vendors are active in the relevant market reduces uncertainties and increases the positive intention to follow through with the transaction (Currie, 2004; Ramiller and Swanson, 2003). In contrast, if trustworthy vendors (McKnight et al., 2002) are absent from the relevant market, then prospective customers, lacking even the most basic cues of reassurance (Jarvenpaa et al., 2000; Pavlou, 2002; Pavlou and Gefen, 2005), may rightfully perceive the situation as dangerously abnormal. Consequently, gauging the characteristics of the SaaS vendor community should be an effective mechanism organizations can harness for developing trust when other types of trust, particularly institution-based trust beliefs (McKnight and Chervany, 2001) are difficult to develop. Drawing upon Pavlou (2002) and Pavlou and Gefen (2004), trust in the SaaS vendor community is defined as the subjective belief with which organizational members collectively assess that favorable conditions are in place in the SaaS market to facilitate SaaS success. Hence,

Hypothesis H2a: Trust in the SaaS vendor community positively affects organizational intention to adopt SaaS.

Perceived Reputation of the SaaS Vendor Community

Perceived reputation of the SaaS vendor community is defined as the subjective belief organizational members use to collectively assess whether there are reputable vendors in the SaaS vendor community.

A positively perceived vendor reputation is presumably acquired after a vendor dependably delivers satisfactory services to a substantial customer base, thereby fostering perceptions about vendor integrity and benevolence (Gupta and Herath, 2005; Heart and Pliskin, 2002b). Perceived vendor reputation has been shown to negatively correlate with opportunistic behavior (Jarvenpaa et al., 2000), and as such, it should be "an important part in determining the willingness of others to enter into an exchange with a given actor" (Hill, 1990).

While the role of perceived reputation of a specific vendor has been widely investigated, perceived reputation of a vendor community has not. Yet, Tirole (1996) argues that "a group reputation is only as good as that of its members" (p. 1), and concludes that "individual reputations are determined by collective reputations, and vice versa" (p. 18). This notion is in line with the conceptualization of Pavlou and Gefen (2005), who elaborate on, and empirically support, the effect of psychological contract violation at the individual buyer level on the community of online sellers. Although they note in their paper (p. 376) that generalizing from individuals to a group only applies when the group can be easily defined based on salient characteristics of its members, such generalization can apply to SaaS vendors because they can be defined as a distinctive group active in a unique environment. Hence, it is suggested that in the absence of stronger cues, potential buyers should generalize to the entire SaaS vendor community from the reputations of vendors who participate in the SaaS market, even if this reputation has been acquired in other IT markets where they exhibit trustworthy behavior. Thus, perceptions that reputable vendors exist in a community of sellers would attest to the positive prospects of the intended SaaS transaction. Hence,

Hypothesis H2b: Perceived reputation of the SaaS vendor community positively affects the organizational intention to adopt SaaS.

Perceived Capabilities of the SaaS Vendor Community

Perceived capabilities of the SaaS vendor community are jointly defined as the subjective belief with which organizational members collectively assess whether there are vendors in the SaaS vendor community who are capable of delivering SaaS according to customer expectations.

The capability or ability of an online vendor to fulfill customer expectations when providing a service has been conceptualized as an antecedent of trust in general (Doney and Cannon, 1997), as in the B2C market (Gefen, 2002; McKnight et al., 2002), but this issue is no less important in the B2B SaaS context. Because of the novelty of the SaaS delivery model for ore organizational applications, organizations need to believe that the SaaS vendor community includes marketers who are capable of consistently and reliably delivering applications to ensure a

transaction, characteristic-based trust is based on familiarity with the trustee, and institution-based trust is based on institutions and mechanisms that attest to the structural assurance and situational normality of the environment.

certain level of service that is expected by the customer. In the absence of this belief, even those who favor the SaaS sourcing option may decide to wait until the market matures and reject adoption altogether or postpone to a later stage. Hence,

*Hypothesis H2*c: Perceived capabilities of the SaaS vendor community positively affect trust in the SaaS vendor community.

While the three types of trust discussed in the preceding sections are posited to directly affect intention to adopt, theory suggests that perceived reputation (Einwiller, 2003) and perceived capabilities of the online vendor (McKnight and Chervany, 2001) are antecedents of trusting beliefs in the context of trust in web vendors. Analogically, these two traits of the vendor community are posited to directly affect trust in the SaaS vendor community. Hence,

Hypothesis H2d: Perceived reputation of the SaaS vendor community positively affects trust in the SaaS vendor community.

Hypothesis H2e: Perceived capabilities of the SaaS vendor community positively affects trust in the SaaS vendor community.

Trust and Perceived Risk

Trust in the SaaS vendor community is important not only because of its direct, positive effect on intentions, but also because it should mitigate three major risks hindering an organization's intention to adopt SaaS: 1) high implementation costs due to the significant discontinuity in current IT governance (Harney, 2004; Kakabadse et al., 2004; Susarla et al., 2003), 2) concerns about risks resulting from transacting over the Internet (Kakabadse and Kakabadse, 2002; Lockett et al., 2006; Walsh, 2003), and 3) opportunism concerns due to long-term dependence on a third party (Gupta and Herath, 2005; Heart and Pliskin, 2002a; Sigala, 2004).

Reducing the level of discontinuity: As explained earlier in this paper, SaaS adoption implies extending the organizational range of control from monitoring and controlling employees to managing relations with external suppliers, and the success of this transition entails the organization acquiring costly processes and skills (Aalders, 2001; Hancox and Hackney, 2000; Lacity and Hirschheim, 1993; Quinn and Hilmer, 1994). In such a scenario, SaaS would be perceived as expensive to implement, particularly when the customer firm has no experience managing this type of relations with external suppliers (Ekanayaka et al., 2002; Heart et al., 2007). Moreover, often this engagement involves a major revamping of IT governance, including changing organizational structures, an action that may comprise totally eliminating the IT department (Soliman, 2003). Understandably, this situation is likely to entail employee resistance and affect internal morale, thus positioning the organization at a competitive disadvantage. Furthermore, trust related to the adoption of innovations such as SaaS can be gradually built when the innovation is trialable (Rogers, 1983), yet SaaS partnering is difficult to try first and even more difficult to reverse when core applications are involved. Clearly, a trustworthy provider could mitigate these risks and thereby decrease costs by fostering a constructive partnership including sharing information with the customer organization (Bakos and Brynjolfsson, 1993; Dyer and Chu, 2003; Nicolaou and McKnight, 2006; Ratnasingam, 2005).

Reducing Internet risk concerns: Although the Internet has been documented as a major concern when considering online transactions (Chang et al., 2005; Jarvenpaa et al., 2000; Walsh, 2003), it is now more widely accepted that adequate technological measures exist to counteract these risks (Chellappa and Pavlou, 2002; Ratnasingam, 2005). For SaaS customers, however, this is contingent on the capability of the service provider to install and effectively operate such measures. Trust in the SaaS vendor community, therefore, is also formed because trustors believe that there are vendors in the relevant market who are capable of mitigating Internet risks (Gupta and Herath, 2005; Heart et al., 2007). Hence,

Hypothesis H3a: Trust in the SaaS vendor community negatively affects perceived risk of SaaS.

Reducing vendor opportunism concerns: Partnering with a third party often raises concerns of opportunistic vendor behavior (Bakos and Brynjolfsson, 1993; Cheon et al., 1995; De Looff, 1995; Kakabadse and Kakabadse, 2000), which is characterized by the trustee's serving its own self-interest with guile (Jarvenpaa et al., 2000; Nicolaou and McKnight, 2006; Tirole, 1996; Williamson, 1985). In the SaaS context an opportunistic behavior could render delinquency to invest the resources required to ensure systems availability, response time, or data security (Heart et al., 2007).

Opportunism is theorized to increase transaction costs, because combating it requires the incorporation of expensive control mechanisms

(Williamson, 1979; Williamson, 1985). By adopting SaaS, the firm becomes fully dependent on a provider for the delivery of its core applications, and, by extension, for the effectiveness of its core activities. Moreover, SaaS usually requires medium- to long-term contracting (Heart and Pliskin, 2002b). The conditions prevalent in long-term relationships, particularly in arrangements that are difficult to reverse, can effect power and information asymmetries that are likely to encourage vendor opportunism (Hart and Saunders, 1997). Therefore, in an effort to mitigate the risk of opportunism, firms can enact measures such as a contract that includes the threat of litigation (Attewell, 1992; Hill, 1990; Sako and Helper, 1998). This, however, is a costly mechanism, both to properly formulate and also to implement later on. Trust has been found to mitigate opportunism concerns and negotiation costs and provide low-cost mechanisms that facilitate commencing risky transactions (Gupta and Herath, 2005; Ratnasingam, 2005). This is because potential trustors are more likely to believe that a trustworthy vendor will perform according to expectations, meaning delivering the service level required and, as such, ensuring systems up-time according to an agreed-upon contract. Put differently, a trustworthy vendor is likely to decrease perceptions of systems unavailability as a result of adopting SaaS. Hence,

Hypothesis H3b: Trust in the SaaS vendor community negatively affects perceived systems unavailability.

Similar reasoning dictates that a trustworthy vendor is more likely to carefully guard its customers' databases and transactions, both at the remote server-farm and on the network. The trustworthy vendor, therefore, is posited to decrease the perceived risk of data insecurity. Hence,

Hypothesis H3c: Trust in the SaaS vendor community negatively affects perceived data insecurity.

Although hypothetically, all types of trust can affect the different kinds of risk, for the sake of simplicity, only the more general trust type—trust in the SaaS vendor community—is addressed here, and the rest are left for future research.

Research Methodology

Instrument Development

Development and validation of the measurement instrument was conducted in three phases (Boudreau et al., 2001): 1) *Item creation*—either adapted to the SaaS context from the literature or newly phrased where required (see Appendix 1), 2) *Item refinement*—by a panel of experts to assure clarity and validity of items (Pavlou, 2002) , and 3) *Instrument pre-test*—by a group of fourteen managers. The pre-test participants were asked to read a short introduction explaining the concept of SaaS (Appendix 1) and then to evaluate the instrument statements on a 1 (strongly disagree) to 7 (strongly agree) Likert scale. After answering, they were interviewed on the clarities of the introduction and of the measurement items, and their answers were used to refine or re-phrase several statements, yielding the final questionnaire (Appendix 1).

Survey Administration

Top organizational decision-makers were selected as respondents, because their perceptions usually shape the organizational intention to adopt SaaS, which is generally a top-down decision. The final questionnaire was e-mailed to a list of about 400 managers, all of who were subscribed to a popular local professional journal. Fifty two usable responses were returned within a period of two weeks, amounting to a response rate of around 13% and reflecting reasonable dispersions among industries, organization sizes, and executive roles. Since the journal was unwilling to disclose the details of the list members, non-response bias could only be assessed by comparing early and late responses, but no significant difference was found. An additional 91 usable questionnaires were collected by distributing them to managers who attended three professional conventions where the questionnaires were placed on banqueting tables and participants filled them in voluntarily. The response rate was about 9%, but again, non-response bias could not be assessed because the organizers were reluctant to provide any details about the participants.

The somewhat unorthodox sampling frame entails limitations that require testing for potential biases, which are dealt with below after the demographics of the respondents are presented. Overall, 143 usable responses were collected, all in Israel, between March and June 2004 when SaaS was still a novel source for mission-critical organizational applications. SPSS 13.0 and PLS-Graph version 03.00, build 1130, were used for the data analysis. PLS-Graph is a component-based partial least square tool that places minimal restrictions on the sample size and residual distributions (Chin et al., 2003).

Table 1 Respondents source by sector and industry

Manufacturing	N	%	Services	N	%
Chip, Electronics, Hi-Tech	19	13%	IT services	35	24%
Metal	9	6%	Public service	12	8%
Chemical Industry	5	3%	Finance & Insurance	7	5%
Food	4	3%	Hospitality and Leisure	6	4%
Plastic	4	3%	Retail	4	3%
Consumer products	3	2%	Logistics	4	3%
Others	5	3%	Others	21	15%
Total	49	34%	Total	89	62%

Table 2 Demographic Properties of the Respondents

Respondent's Position	Number (%)	Years In Position	Years (%)	Years at Organization	Years (%)	Size of IT Dep (Emp.)	Number (%)
CEO (1)	39 (27)	<1	10 (7)	<1	12 (8)	0	33 (23)
Ass. Manager(2)	12 (8)	1-3	30 (21)	1-3	21 (15)	<5	35 (24)
CFO (3)	5 (4)	3-5	26 (18)	3-5	16 (11)	5-10	24 (17)
CIO (4)	28 (20)	>5	71 (50)	>5	83 (58)	11-20	8 (6)
Other (5)	51 (36)					21-30	10 (7)
						>30	21 (15)
Total	135 (95)	Total	137 (96)	Total	132 (92)	Total	131 (92)
Missing	8 (5)	Missing	6 (4)	Missing	11 (8)	Missing	12 (8)
Total	143 (100)	143 (100)			143 (100)		143 (100)

Data Analysis ad Results

Sample Demographics

Among the 143 respondents, 89 belonged to organizations in the services sector (62%), 49 were from the manufacturing sector (34%), and 5 gave no indication (Table 1). As evident in Table 1, two thirds of the sample came from the services sector, and the majority of respondents in each sector came from the IT service or Hi-Tech industries. Because of the unbalanced distribution of the source of respondents, and because of the punctuated cycles of data collection, the sample had to be checked for homogeneity, as explained in the next section.

Most of the 143 respondents held executive positions in their organizations and were veterans in their organizations and in their roles (Table 2). In this study, size of the organization's IT department, the most relevant measure in the context of the present study, was used as a proxy for organization size. Thus, 64% of respondents belonged to organizations with IT departments employing ten employees or less and 28% belonged to organizations with larger IT departments (Table 2). While somewhat biased towards organizations with smaller IT departments, this distribution may be representative of the actual distribution of such organizations in a small country. Nonetheless, the sample size has also been checked against this parameter, as described below in the next section. Forty five (31%) of the respondents said SaaS had been offered to them before and 20 (14%) were actual SaaS users, yet for non mission-critical applications.

Respondents Homogeneity Testing

Prior to data analysis, verification was required that the respondents represent the same population. When this is the case, none of the groups in the data set (grouped first by round of data collection and then by each demographic variable) significantly differs from other groups in perceiving the model constructs. To this end, a one-way analysis of variance (ANOVA) was performed for each of the demographic variables on each of the constructs, calculated as the weighted average of the value of measuring items that converged on the construct.

Each of the data collection rounds (one to four), the demographic traits, and the means and the standard deviations of the constructs, underwent statistical analysis. Only the demographic variable "actual SaaS use" (yes/no) significantly affected the model constructs, with actual users (twenty cases, or 14% of the respondents) generally perceiving the constructs as more positive. This limitation was surmounted by excluding actual SaaS users from the data, which resulted in a sample size of 123 respondents that was still marginally adequate for testing the proposed model using PLS (Chin, 1998).

Next, the data was checked for a common method bias (CMB). Although the error of CMB is more likely when asking about sensitive moral issues or issues associated with social desirability (Spector, 2006), other circumstances associated with the data gathering technique may have caused a shared variance because of the common method employed (Podsakoff et al., 2003). Harman's one-factor test was used to test for CMB by entering all items into a principal component factor analysis. Evidence for a common method bias exists when a single factor emerges from the analysis or when one general factor accounts for the majority of the covariance in the independent and the dependent variables. The results negated this assumption, and therefore, a significant CMB effect could not be supported, but CMB cannot be totally ruled out because Harman's test is considered a relatively weak indicator (Podsakoff et al., 2003). Consequently, the results should be interpreted with caution, as discussed later.

The Measurement Model

Following research guidance, the measurement items were examined for those that violate discriminant and convergent validity tests. All the model's latent variables are reflective, namely, the content of the factor is reflected by its respective measured items (arrows point from the factor to its measured indicators).

Table 3 Results of the Confirmatory Factor Analysis

Items	Intention	Trust in the SaaS Vendor Community	Perceived Reputation of the SaaS Vendor Community	Perceived Capabilities of the SaaS Vendor Community	Perceived Risk	Perceived Data Insecurity	Perceived Systems Unavail
i1	.838	.490	.357	.471	-.547	-.292	-.426
i2	.850	.390	.525	.194	-.425	-.260	-.286
i3	.871	.442	.397	.278	-.369	-.254	-.196
vtr2	.386	.816	.185	.376	-.418	-.355	-.258
vtr3	.490	.878	.113	.211	-.499	-.525	-.416
vr3	.500	.221	.943	.394	-.223	-.161	-.271
vr4	.414	.086	.879	.189	-.181	-.101	-.191
va3	.248	.183	.279	.868	-.203	.024	-.216
va4	.410	.385	.320	.960	-.251	-.061	-.257
pr1	-.510	-.493	-.159	-.193	.910	.658	.607
pr2	-.464	-.438	-.205	-.227	.927	.595	.644
pr3	-.413	-.500	-.249	-.189	.869	.627	.625
pr4	-.508	-.539	-.181	-.296	.913	.723	.670
ds1	-.304	-.402	-.162	-.002	.593	.885	.582
ds2	-.234	-.501	-.099	-.026	.627	.888	.461
ds3	-.270	-.462	-.117	-.064	.653	.836	.487
sa1	-.289	-.360	-.274	-.225	.539	.548	.871
sa2	-.337	-.367	-.235	-.240	.646	.526	.882
sa4	-.313	-.325	-.134	-.205	.674	.473	.897

These items should correlate with their respective factors significantly more than with other factors—measured by the loading of the indicator on its respective factor—and should significantly correlate among themselves as a result of the common factor (Petter et al., 2007). To achieve a clean measurement model based on PLS-graph, items that showed factor loadings of less than 0.7—a high cut-off level that compensates for the inflated loadings of the PLS calculations—were culled (Chin, 1998; Gefen, 2005). Second, items showing high cross-loadings in the confirmatory factor analysis test (Table 3) were also dropped (see Appendix 1), while verifying that theoretical significance was not affected (Anderson and Gerbing, 1988). This was possible because the content covered by the excluded items was mirrored by the remaining items due to the reflective nature of the LVs (Petter et al., 2007). Thus, all retained items had significant weights and high loading values on their respective constructs (Table 4). Two additional tests were used to verify the validity of the measurement model: a) Convergent validity is established when the average variance extracted (AVE) is greater than 0.5 and when composite construct reliability (CR) is greater than 0.7. b). Discriminant validity is established when item loading on the respective factors is greater than 0.7, with weights greater than 0.2 for each item, and when the square-root of AVE is greater than factor inter-correlations (Table 5) (Chin, 1998; Gefen, 2005; Gefen et al., 2000).

Table 4 Item Weights and Loadings

Variable	Weight	Loading	t-values
Intention to adopt SaaS			
i1	0.437	0.837	8.879
i2	0.406	0.826	10.612
i3	0.372	0.837	9.342
Trust in the SaaS Vendor Community			
vtr2	0.534	0.816	8.444
vtr3	0.648	0.873	9.180
Perceived Reputation of the SaaS Vendor Community			
vr3	0.672	0.932	8.111
vr4	0.468	0.843	5.164
Perceived Capabilities of the SaaS Vendor Community			
va3	0.394	0.848	2.561
va4	0.719	0.955	6.311
Perceived Risk of SaaS			
pr1	0.294	0.901	13.375
pr2	0.262	0.920	16.710
pr3	0.263	0.864	9.884
pr4	0.299	0.907	13.404
Perceived Data Insecurity			
ds1	0.367	0.894	7.054
ds2	0.398	0.887	8.445
ds3	0.385	0.830	5.801
Perceived Systems Unavailability			
sa1	0.381	0.869	5.393
sa2	0.398	0.872	6.104
sa4	0.372	0.894	5.936

Table 5 Composite Reliability (CR), Inter-Factor Correlations, and Square-Root AVE

	1 Intention	2 Trust in Vendor Community	3 Perceived Reputation of Vendor Community	4 Perceived Capabilities of Vendor Community	5 Perceived Risk	6 Perceived Data Insecurity	7 Perceived Systems Unavail.
CR	0.873	0.833	0.883	0.898	0.945	0.901	0.912
1	0.834						
2	0.517**	0.845					
3	0.495**	0.173	0.889				
4	0.379**	0.339**	0.331**	0.903			
5	-0.518**	-0.544**	-0.218*	-0.249*	0.900		
6	-0.307**	-0.526**	-0.145	-0.036	0.719**	0.868	
7	-0.351**	-0.405**	-0.246*	-0.254**	0.702**	0.584**	0.881

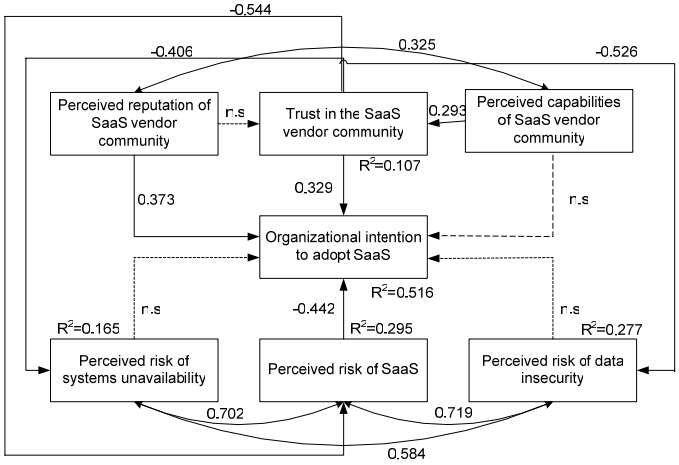
(*p<0.05. **p<0.01)

The results generally attested to the acceptable validity and reliability of the measurement model, since item weights and loadings presented a clean picture, and the square root of AVE is significantly higher than the value of each of the inter-factor correlations.

The Structural Model

Figure 2 illustrates the results of the structural model. Seven of the eleven hypotheses were supported, with all beta coefficients greater than 0.2 and significant for p<0.01. The amount of explained variance in the dependent variable (51.6%), in addition to the size of all beta coefficients, indicate good model fit (Chin, 1998). As hypothesized, perceived risk of SaaS and trust in the SaaS vendor community were significant determinants of an organization's intention to adopt SaaS, while trust significantly affected all three risk-related factors. Interestingly, only perceived risk of SaaS directly affected the intention to use, and it was strongly correlated with the other two risk-related factors.

Figure 2 Results of the structural model (p<0.01)



Finally, f^2 was calculated to gain deeper insights into the predictive power, or the size of the effect, of the factors that affect intention (Chin et al., 2003). The variable f^2 is the ratio $(R^2_{included} - R^2_{excluded})/(1 - R^2_{included})$, and it can be used to elucidate the additional explained variability in the dependent construct contributed by each factor by first excluding and then re-including it, calculating R-square each time. Values of f^2 greater than 0.02, 0.15, and 0.35 reflect small, medium, and large contributions, respectively. The calculated f^2 values show that all three factors with significant effects on intention to use exert medium-sized effects, the strongest being perceived reputation of the SaaS vendor community (Table 6).

Discussion ad Conclusions

Nowadays it is increasingly common for organizations to be confronted with the option to move their core IT to the Internet, either through SaaS or through other B2B e-commerce applications. This study aims to measure the effects of three trust-related and three risk-related factors on the intention of an organization to adopt SaaS. By rendering empirical support to the proposed model, this study provides new insights into the impacts on the intention to adopt SaaS of trust in the SaaS vendor community and of the perceived risk of SaaS.

Ten of the fourteen hypotheses have been supported, thus endorsing several key findings. First, the results substantiate the assumption that the Internet is still perceived as a risky environment for core organizational applications, and therefore, the destiny of SaaS remains questionable. Second, from a theoretical standpoint, the study introduces two distinctive risks—in addition to the more general concept of perceived risk of the Internet—associated with organizational core applications rendered by the Internet: perceived risk of systems unavailability and perceived risk of data insecurity. Although the posited direct effect of these two constructs on the intention to adopt has not been supported, the strong correlations that were hypothesized to exist with the perceived risk of SaaS were demonstrated, possibly implying a multi-dimensional construct. Third, the findings corroborate that, in the absence of other cues, a certain element of trust is extended to the community of SaaS vendors, and this type of trust has a positive effect on the SaaS adoption intentions. Fourth, this study proposes and validates the concept of perceived reputation of the community of SaaS vendors as a driver of adoption intentions. These latter two findings involve relatively new trust notions theorized to substitute for other, more traditional trust beliefs that are typically absent in immature markets. Thus, this study posits, and empirically supports, the notion that the subjective answers to the question, "who is out there in the

Table 6 Results of the F^2 Test

	R2 included	R2 excluded	f2
Trust in the SaaS vendor community	0.516	0.456	0.08
perceived reputation of the SaaS vendor community	0.516	0.415	0.13
Perceived risk of SaaS	0.516	0.45	0.09

SaaS vendor community?" significantly shape the SaaS adoption intention. Fifth, the moderating effect of trust in the SaaS vendor community on perceived risk is also ratified, which not only contributes to the current literature about the relationships between risk and trust, but should also guide potential providers in their attempt to drive SaaS adoption.

Limitations

Although the data sufficiently support the proposed model, several limitations should be noted. First, as mentioned earlier, the study focuses on perceived risk and trust, yet other factors clearly affect the organizational intention to adopt SaaS. Readers should bear in mind, therefore, that the relatively narrow focus of this study is aimed at emphasizing the salient role of perceived risk and trust in the vendor community without excluding the importance of other factors such as organizational and business considerations (see for example Bensaou and Venkatraman, 1996; Chwelos et al., 2001; Iacovou et al., 1995). The model should be expanded, however, in future research.

Second, the non-response bias was difficult to estimate; thus, in spite of the generally negative ANOVA, the results should be received with caution. Furthermore, because of respondent anonymity, there was no way of assuring, during the three conferences at which questionnaires were distributed, that only one respondent per organization filled in a questionnaire. While this limitation could not be eliminated, duplicate respondents from the same organization, if they occurred at all, were rare because of the significant difference of combinations of organizational characteristics among the responses, such as industry, size of IT department, previous outsourcing expertise, and actual SaaS use.

Third, the respondents were asked to reflect on a hypothetical situation—evaluating SaaS for their organizations (see Appendix 1). As this exercise requires a fairly high level of abstraction, the answers may deviate from the more well-formed perceptions elicited after more thorough reflection or practical use. Although questionnaire construction complies with the study's objective to investigate perceptions at the inception of the proposed relations, the abstract quality of the questions warrants some caution regarding the precision of the answers. However, an exploration of the items' distributions showed that they did not substantially diverge from normality; therefore, in the absence of better measures, it can be assumed that because all respondents were subject to similar conditions, this bias is evenly spread and thus less problematic. Furthermore, Tallon, Kraemer and Gurbaxani (2000) show that perceptions of senior management about the impacts of IT were well correlated with objective measures, supporting the assumption that in the absence of objective measures, subjective perceptions may be adequate indicators. In addition, as is frequently the case in similar IT studies, a common-method variance cannot be ruled out in spite of the results of the relevant test, thus caution is appropriate (Tallon et al., 2000). Further, the assumption of causality suggested by the model cannot be supported by the measurement instrument. This is because respondents may have formed an opinion about SaaS immediately upon reading the introduction, or they may have already formed such perceptions before completing the survey instrument (although the majority indicated that they had not considered SaaS prior to the survey). Therefore, it is difficult to know whether respondents decided on a certain level of intention first and *then* justified it by appropriately evaluating the factors, or vice versa, as hypothesized. This limitation is common in survey studies, and as a result, the causal effects are hypothesized based on theory. Finally, although the sample size is marginally adequate according to Chin (1998), more research is required, preferably using a larger and perhaps more focused sample size to validate and improve the results, especially the trust-related factors. In addition, further modification of the measurement items is recommended to refine some item loadings.

Contribution and Implications for Theory

This study makes two primary theoretical contributions to the research into trust and risk as they pertain, in particular, to the online vendor community. First, it elaborates on the concepts of technology- and Internet-related risks that are relevant to transacting over the web. Second, it makes theoretical and empirical contributions to the body of trust-related literature.

Risk has previously been theoretically and empirically established as a strong barrier to the positive intention to engage (Nicolaou and McKnight, 2006), yet most of the literature emphasizes either the risks posed by harmful seller conduct, or the general negative strategic implications associated with the adoption of risky transactions (Chiles and McMackin, 1996; Sako and Helper, 1998; Scott, 2004). A few notable exceptions exist, however, including Chellappa and Pavlou (2002), who investigated the effect of perceived security on trust, and Ratnasingam (2002), who developed the

concept of technology trust, which is the converse of technology risk. Likewise, Pavlou and Gefen (2004; 2005) developed the concept of perceived risk from the community of sellers, but in the B2C context.

The present study maintains and empirically supports the concept that threats imposed by the Internet on organizational IT are still perceived as significant, and as such, they should not be overlooked. Corroborating prior research and theory, the general construct of perceived risk of SaaS was found to be a strong impediment to the SaaS adoption intention, yet the newly developed constructs "perceived risk of data insecurity" and '"perceived risk of system unavailability" had no direct effect on intention. Rather, their effects were fully mediated by perceived risk. This result suggests that perhaps these two constructs are antecedents of perceived risk of SaaS, thus forming a multi-dimensional construct. The structure of this composite construct, however, merits further research in light of the increasing prevalence of organizational transactions on the Web.

The results support the concept of trust in a community of vendors (Pavlou, 2002; Zaheer et al., 1998) and deviate from the traditional dyadic trust relations. Although trust in an online vendor community has already been supported by previous studies (Pavlou and Gefen, 2004; Pavlou and Gefen, 2005), it is, as far as we know, the first time these beliefs were operationalized and empirically tested in a field study within the SaaS context. This is important because SaaS is a relatively new B2B transaction that may eventually become ubiquitous. By integrating conceptualizations from TCE and from trust-related theories, the study shows that perceived trust in the vendor community is an impersonal trust type that shapes intention to adopt possibly by substituting institutional structures (Gefen, 2002; McKnight et al., 2002; Nicolaou and McKnight, 2006; Zaheer et al., 1998) that are absent when a market is immature. These beliefs thus represent the only guidance available to organizations for trust formation when familiarity and prior experience are irrelevant. Extending previous knowledge, the results of this study support the notion that perceptions about the characteristics of the vendor community, in particular the reputations of participating vendors, can substitute for the institutional structures for trust formation that may be absent (Chang et al., 2005; Tirole, 1996).

An additional contribution this study makes is the support and extension of the concept of organizational trust. Corroborating Zaheer et al. (1998), the results attest to the effectiveness of this trust concept and widen its scope to include not only trust of a familiar partner organization, but also of a group of vendors. Hence, a broader insight of impersonal organizational trust is gained by integrating conceptualizations from Zaheer et al. (1998) and from Pavlou (2002). More research about impersonal, inter-organizational trust is required to further elucidate its driving mechanisms and its impact on emerging B2B e-markets.

Perceived capabilities of the SaaS vendor community is a new construct developed in this study, although Pavlou and Gefen (2005) use this concept as an item reflecting the "trust in the online vendor community" construct. The results do not support the hypothesis that perceived vendor capabilities directly affect the intention to adopt SaaS, although it has been found to significantly affect trust. Hence, it is suggested that trust in the SaaS vendor community mediates the effects of perceived capabilities of the SaaS vendor community on intention, an issue that requires further research.

In contrast, perceived reputation of the vendor community is a strong, direct predictor of intention to adopt SaaS, while its direct effect on trust is insignificant. Together with the effect of trust on intentions, this result supports the current focus of this paper, which is the strength of SaaS vendor community characteristics to drive initial trust formation. Thus, when asking "who is out there in the SaaS vendor community?", organizations mainly gauge the *reputations* of major players in this market. Drawing upon Tirole (1996), the presence in or absence from the SaaS market, of reputable IT vendors is not only a sign as to the potential of the partnership for the prospective organization, but also for the sustainability of this IT delivery paradigm altogether (Gruman, 2007). In this context, perceived reputation is perhaps a substitute or a proxy for situational normality and structural assurance (McKnight et al., 2002).

In agreement with prior studies (Gupta and Herath, 2005; Lockett et al., 2006), trust has been found to significantly moderate all three risk perceptions. Hence, the results support the assumption that SaaS vendors are expected by potential customers to be capable of counteracting and mitigating Internet risks. This is an important insight into the persistent problem of the Internet as a barrier to the adoption of SaaS, and therefore, it merits further research.

From a descriptive point of view, the study helps explain the process by which organizations develop

intentions to adopt SaaS and perhaps other web-delivered applications and services. When associated with core applications, the adopting organization becomes vulnerable to the performance of the provider and to risks imposed by the Internet. Clearly, risk perceptions dominate the intention creation climate, exerting negative forces on the adoption intention. Arguably organizational actors would search for information, signals, and cues to assess the probabilities of successful adoption. Trustworthy and reputable vendors in the SaaS market are undoubtedly reassuring signals that drive trust, which may counteract the negative impacts of perceived risk of SaaS. Put differently, obviously if organizational actors ask "who is out there in the SaaS vendor market?" and find that most of the trustworthy IT players are absent, they would rightfully perceive this as a negative and ominous signal, not only about the probabilities of positive outcomes, but also about the overall destiny of SaaS. Swanson and Ramiller (1997) illustrate the formation of an "organizing vision" (p. 459) as a result of information and signals pertaining to an evaluated IT innovation, and argue that the nature of this organizing vision impacts adoption intentions. Drawing upon their argument, the results empirically support the assertion that perceptions about the characteristics of the specific vendor group are an important part of the organizing vision. Having major vendors embrace the innovation as a new line of business clearly contributes to a positive organizing vision. In contrast, the absence of such vendors would most likely have a negative impact. This research avenue is intriguing; yet, as far as could be elicited from the literature review, it has not been frequently pursued (Currie, 2004; Ramiller and Swanson, 2003). The current study is therefore a step in this direction, but still more work is warranted.

On the empirical side, the SaaS risk constructs were operationalized and empirically tested in a field study. These constructs should be important in other investigations of intentions to adopt web-driven applications in the B2B domain. Therefore, the scales to measure these constructs must be developed further.

Implications for Practice

The practical implications of this study apply mainly to SaaS vendors, including small, newly-established, and large, reputable providers. Consultants and other practitioners can also gain valuable insights into the key issues influencing the sustainability of this growing market. All SaaS vendors should be aware of the material role the trustworthiness of the whole vendor community plays in forming adoption intentions, although the implications are different for established vendors as opposed to new entrants to the market. New SaaS vendors should be aware that they are unlikely to be perceived as suitable partners for SaaS delivery, particularly not for the delivery of core applications. Some new SaaS vendors have developed organizational applications initially structured for remote delivery, and clearly, they should be superior to the traditional client-server applications that were awkwardly transformed for delivery over the Internet (Currie, 2004). Nonetheless, and in spite of this relative advantage, potential customer organizations, large and small, would presumably be reluctant to partner with such vendors. In contrast, customer organizations would arguably prefer partnering with the big IT vendors in spite of the fact that they might offer inferior applications. This is because the established, large IT companies are perceived to be more capable of delivering the promised services and of mitigating the risks, and they typically refrain from exerting opportunistic behavior. Perhaps the solution for newly established vendors is to partner with the giant, reputable, and trustworthy IT vendors, even to the extent that they would openly carry the "reputable" names.

The results indicate that the large and reputable IT vendors are more likely to succeed in this emerging market, provided they understand that they are expected not only to properly deliver organizational applications, but also to mitigate the various associated risks. SaaS is not just another IT product; the importance of the trust-related constructs attest to SaaS being perceived by potential adopters as an on-going, strategic partnership between customer and vendor organization. Therefore, partnerships between new and established vendors should yield a win-win arrangement for two reasons: 1) Smaller vendors could better cater to the needs of smaller companies, leaving the big customers for the major vendors, and 2) the major IT players would benefit from new, agile, and well structured products, more smoothly delivered over the Internet.

Finally, the results support a plausible explanation of the past failure of SaaS to fulfill its potential. The first generation of SaaS was characterized by the absence of major IT vendors. Rather, the vendor community was largely composed of newly formed providers, whose trustworthiness was not yet established. When gauging the SaaS vendor community, therefore, potential customers could not find adequate cues that would both drive the initial trust formation and also mitigate risks. Arguably, the absence of major IT sellers implied that this market had a questionable destiny, thus augmenting risk perceptions and decreasing intention to adopt.

Substantially different from its original manifestation, the current SaaS market attracts the major IT vendors, which may decrease risk perceptions and drive positive intentions to adopt SaaS as an alternative to in-house installed applications. However, the true destiny of SaaS—will it eventually become a dominant IT sourcing option, or is it just more IT hype?—remains to be seen.

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