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Review

How shall I trust the faceless and the intangible? A literature review on the antecedents of online trust

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ABSTRACT

Trust is generally assumed to be an important precondition for people's adoption of electronic services. This paper provides an overview of the available research into the antecedents of trust in both commercial and non-commercial online transactions and services. A literature review was conducted covering empirical studies on people's trust in and adoption of computer-mediated services. Results are described using a framework of three clusters of antecedents: customer/client-based, website-based, and company/organization-based antecedents. Results show that there are many possible antecedents of trust in electronic services. The majority of the research has been conducted in the context of e-commerce; only few studies are available in the domains of e-government and e-health. For many antecedents, some empirical support can be found, but the results are far from univocal. The research calls for more, and particularly more systematic, research attention for the antecedents of trust in electronic services. The review presented in this paper offers practitioners an overview of possibly relevant variables that may affect people's trust in electronic services. It also gives a state-of-the-art overview of the empirical support for the relevance of these variables.

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1. Introduction

Perhaps the most important innovation of the last few years is the Internet technology, as it allows people to interact and transact with others without the constraints of time and space. Organizations can considerably thank the aforementioned technology for providing them with the possibility of extending their services outside their walled offices and shops. Probably people also have more reasons to be grateful about being able to buy things or avail of different services anytime, anywhere.

Nevertheless, the apparent blessings computer-mediated transactions bring may be countered by fear and anxiety. Transactions characterized as faceless and intangible are plagued with a host of concerns, which could result in people's reluctance to engage in any form of online transaction. The wider acceptance of online transactions, despite the perceived risks involved, depend not only on the estimated benefits they offer but also on people's trust in online transactions, in the technology used for the transactions, and in organizations as the other parties in the transactions.

Lack of trust in the organization as the other party in a transaction is often blamed for people's disinclination to engage in an online transaction (Hoffman, Novak, & Peralta, 1999), in general, and in online economic exchanges (Grabner-Kraeuter, 2002; Lee & Turban, 2001), in particular. In recent years, both the academe and the business sector have shown a heightened interest in trust within the context of the digital environment. Knowing the nature of online trust and its determinants has become an important goal. This is obvious since online trust is regarded as a crucial factor for the success of an online enterprise or initiative.

This article discusses the different determinants of online trust, as identified in different empirical studies, with the objective of understanding its nature and its formation. Studies cited in this paper, however, were done mostly in the context of e-commerce, considering the profusion of investigations pursued in that domain. Since trust is also an important factor in the adoption of e-government (Belanger & Carter, 2008; Horst, Kuttschreuter, & Gutteling, 2007; Welch & Hinnant, 2002) and e-health (Sillence, Briggs, Fishwick, & Harris, 2004) services, results of a few studies on online trust in those two contexts will also be included in the discussions. We aim at a comprehensive and multidisciplinary overview of the antecedents or determinants of online trust by looking at those identified in empirical studies within the contexts of e-commerce, e-government, and e-health.

In the first section of the article, the nature of trust, in general, will be explained according to the perspectives of psychology,

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social psychology, and sociology. The second section deals with the concept of online trust and how it differs from trust in an offline setting. The third section presents the comprehensive discussion of the different determinants or antecedents of online trust based on results of different empirical studies. Antecedents of trust are categorized into three: customer-/client-based, web-based, and company-/organization-based. This categorization is founded on a framework developed by Chen and Dhillon (2003). The paper ends with an elaboration of points for future research in online trust.

2. Trust – under a multidisciplinary microscope

2.1. The definition predicament

The problem with trust as a concept is that it does not have a universally accepted definition yet (Barber, 1983; Das & Teng, 2004; Kee & Knox, 1970; McKnight & Chervany, 2002; Rosseau, Sitkin, Burt, & Camerer, 1998). From the profusion of trust definitions emerges a two-way stream of trust conceptualization. The first centers on trust as an expectation regarding the behavior of an interaction partner (Barber, 1983; Koller, 1988; Luhmann, 1979; Rotter, 1967), whereas the second couples trust with acceptance of and exposure to vulnerability (Doney, Cannon, & Mullen, 1998; Mayer, Davis, & Schoorman, 1995; Rosseau et al., 1998; Zand, 1972).

Different disciplines treat trust as a research interest in significantly different ways. Lewicki and Bunker (1996) categorize trust research into three, as defined by a particular disciplinary perspective. First, trust is regarded as an individual difference from the viewpoint of personality theorists. Second, trust is considered as an expectation of another party in any interaction or transaction proposed by social psychologists. Third, trust is an institutional phenomenon according to sociologists and economists. We will elaborate on the different conceptualizations of trust according to the categorization given.

2.2. Trust as an individual feature

Viewed from the individual level, trust is best understood by looking at the psychology of the person. Such a perspective can explain why a person trusts and why trust declines or increases (Tyler & Kramer, 1996, p. 10). Jones and George (1998) propose the notion of trust as a psychological construct. As such, the interaction of an individual's values, attitudes, moods, and emotion is expected to result in an experience of trust (Jones & George, 1998).

Trust is also regarded as an attitude, which is neither subjective nor objective, and does not simply involve mechanical influences from the environment since it has to be learned (Luhmann, 1979, p. 27). Viewing trust as a psychological state implies that people vary in terms of when and how much they are willing to trust. Such willingness to trust, according to Tyler and Kramer (1996, p. 10), is based on people's estimation of the probability that those trusted will reciprocate the trust.

Some people are just more trusting than others, indicating substantial variations in their propensity or disposition to trust (Mayer et al., 1995), defined as the tendency for human beings to believe in the trustworthiness of others (Das & Teng, 2004). Claiming that individuals vary considerably in their trust propensity aptly corresponds to Rotter's (1980) proposition that in terms of trusting people can be positioned in a spectrum from high to low.

People's readiness to trust depends on the systemic nature of their personalities (Luhmann, 1979, p. 5). This readiness also varies from one person to another and from situation to situation (Worchel, 1979). Variations in propensity to trust among people can be attributed to their developmental experiences, personality types, and cultural backgrounds (Mayer et al., 1995). Trusting propensity or trusting impulse could be specific or general – it could refer to a specific category of people or it could encompass all people (Sztompka, 1999, p. 65).

As a stable factor, trust determines the likelihood that people will trust, just as it influences how much they trust others prior to the availability of any data about them (Mayer et al., 1995). Rotter (1971) argues that people's propensity to trust influences their levels of trust in their interactional partners, especially in cases when the former has limited knowledge about the latter.

In the model of initial trust formation by McKnight, Cummings, and Chervany (1998), propensity or disposition to trust is proposed to be one of the determinants of trusting intention. They identify two types of disposition to trust: faith in humanity and trusting stance. Faith in humanity refers to the belief that others are well-meaning and reliable; whereas trusting stance means that people believe that they will obtain better interpersonal outcomes by dealing with others as though they are well-meaning and reliable, regardless of whether those others are reliable or not (McKnight et al., 1998).

McKnight, Choudhoury, and Kacmar (2002) define trusting intention as people's willingness or intention to depend on their interactional partners. Willingness to depend (volitional preparedness to make oneself vulnerable to the trustee) and subjective probability of depending (perceived likelihood that one will depend on the other) form two distinct subconstructs of trusting intention (McKnight et al., 2002).

2.3. Trust as an expectation

Lewis and Weigert (1985) stress that individuals would have no occasion or need to trust apart from their relationships with others. This assertion emphasizes the sociological function of trust instead of its supposed psychological function. Trust is an essential ingredient in the initiation and maintenance of stable social relations, just as exchange obligations promote trust (Blau, 1964).

Luhmann (1979, p. 39) views trust as a generalized expectation that others will handle their freedom, their disturbing potential for diverse action, in keeping with their personalities – or, rather, in keeping with the personalities they have presented and made socially visible. Koller (1988) furthers the association between trust and expectation by referring to trust as people's expectation that others are able and willing to behave promotively towards them, despite the freedom of the ones trusted to choose among alternative behaviors that could have negative consequences for those who trust.

To view trust as an expectation regarding the behavior of other people is to affirm that social relations and exchanges are not devoid of ambiguities. This implies that the necessity to engage in human transactions obliges individuals to resort to trusting behaviors despite the uncertainties that trail social contacts just for the sake of active participation in various social interactions. Luhmann (1979) argues that trust reduces social complexity, as it simplifies life by the taking of a risk. In the later part of this paper, we will dwell on the nature of trust as the acceptance of risk.

Barber (1983) identifies three kinds of expectations in relation to trust: (1) an expectation of the persistence and fulfillment of the natural and social order, (2) an expectation of the technically competent role performance from those involved with an individual in social relationships, and (3) an expectation that partners in interactions will carry out their fiduciary obligations and responsibilities. The three presented perspectives on trust as an expectation highlight trustors' beliefs that the trustees are good and honest in dealing with the goods, material or non-material, entrusted to them despite their ability to cheat or betray the trustors.

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Trust is partially a product of people's capacity to assess the trustworthiness of their potential partners (Sheppard & Sherman, 1998). Trust, therefore, can be considered as the reflected trustworthiness of the trustees and their trustworthiness that is subjectively entertained in the judgment of the trustors (Sztompka, 1999, p. 70).

The potential partners then have the burden of not only creating trust but also maintaining it and this process involves the duty of presenting themselves as trustworthy persons (Haas & Deseran, 1981). This corresponds to Goffman's (1959) presentation of the self theory, which proposes that people are constantly engaged in managing and controlling the impressions they make on others to attain their goals.

In assessing the trustworthiness of interaction partners, people can use a set of criteria to come with a reliable assessment. These criteria or factors of trustworthiness (Mayer et al., 1995) include ability or competence (Barber, 1983; Luhmann, 1979; Mayer et al., 1995; McKnight et al., 1998), benevolence (Luhmann, 1979; Mayer et al., 1995; McKnight et al., 1998), integrity or honesty (Mayer et al., 1995; McKnight et al., 1998).

Based on the characterization of Mayer et al. (1995), parties in transactions are assessed to be trustworthy when they (1) have the required skills, competencies, and characteristics that enable them to exert influence within a specific domain – a description for the ability or competence criterion, (2) are believed to do good to trustors, setting aside an egocentric motive – thereby meeting the benevolence criterion, and (3) are perceived to adhere to a set of principles that trustors consider acceptable – a definition of integrity.

Sztompka (1999) also claims that people employ three criteria in estimating the trustworthiness of their transactional partners: reputation, performance, and appearance. Reputation refers to a record of past deeds; whereas, performance includes actual deeds, present conduct, and currently obtained results. Appearance also matters as one's look and self-presentation can exude trustworthiness or stimulate suspicion on the part of the looker (Sztompka, 1999).

2.4. Trust as acceptance of and exposure to vulnerability

Zand (1972) argues that when people trust they are increasing their vulnerability to others whose behavior they cannot control. Mayer et al. (1995) conceptualize trust as a willingness of people to be vulnerable to the actions of others based on the expectation that the latter will perform a particular action important to the former, irrespective of the ability to monitor and control the latter.

The idea of being vulnerable when trusting skews towards the realization that while uncertainties and ambiguities are abounding in all forms of exchanges and transactions, risks creep underneath. As Doney et al. (1998) advance, sources of risks are related to vulnerability and/or uncertainty about an outcome. Therefore, trust can be regarded as people's behavioral reliance on others on a condition of risk (Currall & Judge, 1995).

And so we can ask: do we trust because there are risks or do we take risks because we trust? The first question emphasizes that risks determine trust (Koller, 1988; Lewis & Weigert, 1985), while the second question supposes that trust is an antecedent of risk-taking behavior in any relationship, in which the form of risk-taking, according to Mayer and colleagues (1995), is dependent on the situation. People's level of trust in their interaction partners is positively related to the perceived risks present in the situation. This means that an increase in risk perceptions could result in the augmentation of people's degree of trust (Koller, 1988; Mayer et al., 1995).

Even when risk is negligible in an exchange situation, trust is still necessary as long as the possibility for trust to be betrayed exists (Kee & Knox, 1970). Risk is indispensable in the cultivation of trust because trust would not be necessary if actions could be pursued with absolute certainty (Lewis & Weigert, 1985).

We can either have complete or incomplete information, or even, without any information at all, regarding the chances of our trust being reciprocated. In Bachmann's (1998) view, trust is necessary in situations in which trustors have partial information about the factors that will possibly influence trustees' future behavior. Luhmann (1979, p. 32) maintains that in reality there is less information than required to be assured of success when trusting. This assertion cements the exigency of trust in an environment abounding in uncertainties and ambiguities.

2.5. Trust as an institutional phenomenon

Lewis and Weigert (1985) contend that trust, from a sociological perspective, should be viewed as a property of collective units (dyads, groups, and collectivities), and not of isolated individuals. As a collective attribute, trust is applicable to the relations among individuals rather than to their psychological states taken individually (Lewis & Weigert, 1985). From the perspective of social exchange, human interactions are grounded on exchanges involving material and non-material goods (Blau, 1964; Homans, 1958; Homans, 1961).

Blau (1964, p. 91) defines social exchange as the voluntary action of individuals who are motivated by the returns they are expected to bring and typically do in fact bring from others. He adds that the benefits involved in social exchange are not definitively priced in terms of a single quantitative medium of exchange. This is the reason why obligations in social exchanges are not specific, while economic exchanges are moored on a formal contract that specifies the exact amount to be exchanged. Though both exchanges conceptually differ (Emerson, 1987), both also depend on trust for their continuation and completion (Buskens, 1998; Doney et al., 1998; James, 2002), just as both exchanges involved varying amounts of uncertainty and risks (Molm, Takahashi, & Peterson, 2000).

Groups, organizations, and institutions must also work together. Pronounced division of labour results in strong ties of dependence, and trust is a requirement for effective operation (Sztompka, 1999, p. 64). Within the framework of social relations, trust is a product of people's dependency on others, since people have needs that require the services of others and trust must be dealt with (Kipnis, 1996). Viewing trust as an institutional phenomenon indicates the need to acknowledge that trust is not only confined within interpersonal relations but also extends to relations between a person and an organization and between organizations or institutions (Lewicki & Bunker, 1996).

Trust is essential in economic exchanges. Viewed from an economic standpoint, trust is an expectation that people will not be exploited by others, which exists when there are no strong incentives for people to behave opportunistically (James, 2002). Hosmer (1995) refers to trust as the reliance by one person, group, or firm upon a voluntarily accepted duty on the part of another person, group, or firm to recognize and protect the rights and interests of all parties engaged in a cooperative endeavor or economic exchange.

Tullberg (2008) argues that in most economic exchanges, not everything can be verified before the occurrence of a transaction, thereby making the elimination of risks impossible and thereby necessitating trust. For instance, within marketing, customers need to determine the extent to which they trust the company and its personnel to make purchases and long-term relational commitments (Doney & Cannon, 1997).

2.6. The rationality and irrationality of trust

People as *homo economicus* often calculate the costs and projected outcomes of their decisions to trust. From a rational

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perspective, trusting involves expectations about interaction partners based on calculations which weigh the cost and benefits of certain courses of action to either the trustors or the trustees (Lane, 1998). Sztompka (1999, p. 60) echoes a similar view by emphasizing that from a rational-choice perspective, both trusters and the trustees are rational actors attempting to maximize their utilities (the goals realized, benefits achieved, profits obtained minus costs incurred) by rational calculations using whatever information is available. Uncertainties in social relationships prompt calculativeness and a preference for shorter term returns (Anderson, 1971; as cited by Chadwick-Jones, 1976, p. 343). The degree of calculativeness in trusting relationships changes both with the contexts and the objects of the trust, just as it varies according to the stages of trusting relationships (Lane, 1998).

The claim for the rationality of trust is grounded on the justification that it is based on empirically grounded expectations of other people's or institutions' behavior (Hardin, 1991). Rational trust, therefore, implies that people fastidiously define how much trust they grant to whom – that their trust varies according to situations and to the level of relationships they have with their interaction partners. Furthermore, trusting behavior from a rational perspective involves people trusting those proven not to betray their trust.

However, the rational-choice perspective on trusting behavior is criticized for its failure to accommodate large, highly risky trusting acts that occur early in a relationship (Weber, Malhotra, & Murnighan, 2005). Citing the experimental study on investment game by Berg, Dickhaut, and McCabe (1995), Weber et al. (2005) note that in some cases people display a willingness to trust people they do not know and will never meet or see.

Another flaw in the rational choice approach, according to Weber et al. (2005), is the inclination to view trustors and trustees symmetrically under the premise that each party interprets each other's actions similarly. They add that although many trusting relationships develop between parties with congruous perspectives on relevant matters, the likelihood that trusting parties will be asymmetrically dependent on their relationships is incontrovertible.

Hardin (1991, p. 201) himself admits that although trust is grounded on instrumental motives, such as the initiation and completion of an exchange or the pursuit of common goals, trust can also depend on non-rational factors such as love or altruism and may involve a loose confluence of diverging interests. In extreme cases, trust is even necessary when people are in desperate situations from which they cannot extricate themselves without help (Coleman, 1990, p. 107). This exemplifies the scenario of two parties having an asymmetrical dependency in a trusting relation – one is dependent on the other, but not the other way around.

In such a situation, as the dependency of trustors on trustees increases, the former will (a) lower information search to assess the latter's trustworthiness; (b) be more inclined to appraised ambiguous information about the latter positively; (c) exaggerate the probability that the latter will reciprocate; (d) be more likely to engage in initial trust acts; and (e) be increasingly prompted to trust carelessly (Weber et al., 2005).

3. From offline trust to online trust

Online trust is defined as an attitude of confident expectation in an online situation of risk that one's vulnerabilities will not be exploited (Corritore, Kracher, & Wiedenbeck, 2003). Online trust is also viewed as reliance on a firm by its stakeholders with regard to the firm's business activities in the electronic medium, and in particular, its website (Shankar, Urban, & Sultan, 2002). While the first definition applies to online interactions in general, the second definition is more appropriate when understanding online trust in the context of online economic exchanges.

Is there a difference between how people trust others in the physical world and how they trust others when they are in an online environment? Corritore et al. (2003) argue that in understanding online trust, one should resort to existing works on offline trust, as results of a substantial number of studies on trust in offline settings are applicable to trust in online environments. They add that the common denominator between the two is their rootedness on exchange, which, in both settings, is hampered by risks, fear, costs, and complexities. Therefore, the notions of trust as an acceptance of and exposure to vulnerability and as an expectation regarding the behavior of the interaction partner are valid when applied in online relationships and exchanges.

Just like in offline interactions, the targets of trust in online transactions also have the burden of presenting themselves as trustworthy parties (Haas & Deseran, 1981). To be assessed as trustworthy, online organizations must work to improve their reputation, performance, and appearance – with appearance corresponding to the design of their website interface, for instance. At the same time, Internet users hold the prerogative to assess the trustworthiness of their online transactional partners based on the criteria of competence, benevolence, and integrity. More importantly, in understanding online trust from a purely economic perspective, the economic definitions of trust (Hosmer, 1995; James, 2002) should be appropriate.

However, differences are also inherent between offline and online trust. Quoting Marcella (1999), Shankar et al. (2002) cite that offline and online trust differ in terms of their objects of trust. In trusting offline, the object of trust is typically a person or an entity (organization); whereas in an online context, the technology (primarily the Internet) and the organization deploying the technology are the proper objects of trust. From a marketing perspective, in contrast to traditional commerce, where the objects of customers' trust are only the sellers or the companies they represent (Doney & Cannon, 1997), customers in electronic commerce have to trust not only the website but also the company behind the site, and even an explanation of why the site is trustworthy (Boyd, 2003). These points accentuate the complicated nature of trust in online commercial exchanges.

The unpredictable nature of the Internet breeds environmental uncertainties that spawn risks (Pavlou, 2003). In online transactions two uncertainties are certain: the risk of losing one's money during the exchange and the threat of having one's private sphere penetrated. The inevitability of risks may necessitate the cultivation of trust if one really intends to engage in online exchanges and savor their potential benefits without the constant fear of the risks present.

The inevitability of a 'first-time' in online situations makes trusting strenuous (Boyd, 2003). This suggests that people who lacked experience with online transactions and with online organizations would have a totally different level of trust compared to those with enough experience. Therefore, if trust among those with experience is grounded on the quality of and satisfaction with their previous transactions, what would be the bases of trust for those without any experience?

Empirical studies on the determinants of trust and perceptions of trustworthiness in online exchanges abound. Different studies identify different trust cues that could influence Internet users' trust in online transactions and in online organizations. According to Grabner-Kraeuter (2002), the willingness of users to make a risky advance concession (disclosing credit card information, for example) depends on their evaluation not only of the sellers' trustworthiness, but also of the functionality and reliability of the electronic commerce system. In this paper, the antecedents of trust are categorized into three: customer/client-based, website-based, and organization/company-based.

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The discussion of the different antecedents of trust in online transactions in this paper is based on results of different empirical studies on trust in electronic exchanges, primarily in the context of e-commerce, and sporadically, within the contexts of e-government and e-health. Presented on Table 1 is a summary of the empirical studies on trust antecedents cited in the discussion section, with brief citations of the hypotheses, methodologies, and findings of the studies.

4. Customer/client-based trust antecedents

4.1. Propensity to trust

Individuals vary in the amount of trust they extend to their exchange partners (Mayer et al., 1995). In the context of online economic exchanges, some customers display a greater disposition to trust anything and anybody and are more likely to trust a web vendor despite having only limited information about it, whereas others need more information to form trusting beliefs (Salam, Iyer, Palvia, & Singh, 2005). However, empirical studies on the impact of propensity to trust on the formation of online trust yielded conflicting results.

Studies show that propensity to trust has a positive effect on online trust formation (Gefen, 2000; Teo & Liu, 2007). Gefen (2000) argues that since propensity to trust is built over a lifelong period and reflects social influence over extended period, it should be expected that trust would vary across cultures. Differences in the degrees of trust in and the rates of adoption of computer-mediated exchanges among different cultures are a given.

Koufaris and Hampton-Sosa (2004), however, find no statistical support for the assumption that propensity to trust affects initial online trust in the company. They contend that when customers have no prior experience with a company, they may ignore their general tendencies to trust others, and instead form their trust beliefs based on their perceptions about the company and its website.

Propensity to trust facilitates either the magnification or the reduction of the impact of website attributes as trustworthiness cues (Lee & Turban, 2001). The moderation effect of propensity to trust is directly related to the formation of trust based on the trust attributes of the system. Thus, it is argued that the higher the level of trust propensity, the greater is the impact of the attributes on trust formation.

4.2. Experience and proficiency in Internet usage

Metzger (2006) attributes customers' perception of risks to their levels of experience with online commerce, as compared to their experiences with traditional forms of exchanges. From this assertion, it can be hypothesized that people who are highly proficient with the web are more likely to have low perceptions of risks in using the web and be more inclined to trust online transactions. Proficiency in web usage can be understood to mean the skills of customers in using computer technology.

Corbitt, Thanasankit, and Yi (2003) show that customers' level of Internet experience is positively related to the degree of trust in an e-commerce website. The researchers claim that customers' level of Internet experience is likely to affect their tendency to trust the technology, which may also enhance their trust in electronic commerce.

A study by Aiken and Bousch (2006), however, advances that the relationship between Internet experience and online trust is positive in the case of novice and intermediate users, and negative in the case of intermediate and expert users. Describing such relationship as an inverted U, they advance that people's trust increases in the early stages when their Internet experience also increases. At higher levels of experience, trust declines when they accumulate more knowledge about possibilities that things could go wrong, which increases their privacy and security concerns.

5. Website-based trust antecedents

5.1. Perceived ease of use of the website

One of the important variables in the technology acceptance model of Davis (1989) is the perceived ease of using a particular technology – referring to the degree to which people believe that using a particular system would be relatively easy. Perceived ease of use in the context of electronic services centers on the navigational structure of the website, which includes search functions, site maps, product indices, and the overall design and organization of the websites (Lohse & Spiller, 1998). Grabner-Kraeuter (2002) argues that effective navigation is one of the best ways in communicating trustworthiness in the online exchange environment.

The impact of perceived ease of use on the formation of trust in e-commerce has been supported in several empirical studies (Bart, Shankar, Sultan, & Urban, 2005; Chen, 2006; Flavian, Guinaliu, & Gurrea, 2006; Koufaris & Hampton-Sosa, 2004). A large-scale study on the determinants of trust in different types of websites discloses that electronic vendors whose websites have easy-to-use features and have the capability to direct their customers to their destinations quickly can easily gain the trust of their customers (Bart et al., 2005).

Chau, Hu, Lee, and Au (2007) claim that the ease of using and navigating a website significantly influenced customers' trust in the electronic vendor, especially during the initial encounter, for instance, when customers were still searching for information. Flavian et al. (2006) argue that low levels of usability may generate technical errors, which could increase customers' feelings of distrust and could discourage them from ever engaging in subsequent online exchanges.

5.2. Information quality

As customers expect that any website should be free from errors (Bart et al., 2005), they are likely to trust websites that contain accurate, current, and complete information (Kim, Song, Braynoy, & Rao, 2005) and those that adhere to the rules of correct spelling, grammar, and syntax (Koehn, 2003).

According to Liao, Palvia, and Lin (2006), the content quality of an e-vendor's website (referring to the usefulness, accuracy, and completeness of the information offered) may increase customers' trust in online transactions. The researchers cite that since customers are not in the position to touch and feel the item in online shopping, they require detailed and clear information to decide on the purchase.

The quality of information on e-health websites is also crucial for the development of trust in the e-health services. Empirical investigations by Sillence et al. (2004), Sillence, Briggs, Harris, and Fishwick (2007) reveal that users of e-health sites trusted sites that can demonstrate in-depth knowledge of a wide variety of relevant topics and deliver clear information.

5.3. Graphical characteristics

Kim and Moon (1998) investigated the impact of a website's graphical characteristics by manipulating elements such as clip arts and colors in the design of an online banking website. The study reveals that an interface without a clipart aroused feelings of untrustworthiness on the part of customers, while a screen with three-dimensional, dynamic clipart enhanced the users' feelings of trustworthiness towards the banking system. They also found that

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Table 1
Empirical studies on the determinants of online trust cited in this paper.

Study	Methodology	Analytic techniques	Hypothesized determinants of online trust	Statistically significant determinants of online trust
Experiential surveys/online surveys				
Gefen (2000)	Experiential survey with 217 students (USA) tasked to inquire and purchase books from Amazon.com	Confirmatory Factor Analysis with LISREL 8	Familiarity with an e-commerce vendor; disposition to trust	Familiarity with an e-commerce vendor; disposition to trust
Jarvenpaa et al. (2000)	Experiential survey with 184 students (Australia). They were asked to perform 4 shopping activities: (1) selecting and buying a gift, (2) buying a book for a course, (3) planning a trip to Helsinki, and (4) planning a work-related trip to Sydney	Confirmatory Factor Analysis with AMOS 3.6	Perceived size of the e-vendor; perceived reputation of the e-vendor	Effects of perceived size and perceived reputation on trust depend on the type of store
Kimery and McCord (2002)	Experiential online survey with 164 business students (Canada) instructed to search the website for a product	Path Analysis using SAS System's CALIS procedure	Attention to assurance seals (privacy, process, technology seals); disposition to trust	Disposition to trust (sig. at 0.05)
McKnight et al. (2002)	Experiential survey with 1403 students asked to search for their legal rights by visiting a legal advice website	Structural equation modelling using LISREL 8.3	Structural assurance of the web; perceived company reputation; perceived website quality	Structural assurance of the web; perceived company reputation; perceived website quality
Yoon (2002)	Experiential survey with 122 students (South Korea) instructed to simulate an online product purchase for two items: a notebook computer and a music/game CD	Regression analysis	Security of the transaction, website properties, navigation functionality, personal variables (familiarity and satisfaction with e-commerce)	Security of the transaction, personal variables
Corbitt et al. (2003)	Online survey with 80 valid responses coming from students (New Zealand)	Linear regression analysis	Perceived market orientation; perceived technology trustworthiness; user's web experience; perceived site quality; risk perception (−)	Perceived technology trustworthiness; perceived site quality
Kim et al. (2003)	Experiential survey with 182 students (Korea) tasked to shop for an item of their choice using a credit card	Partial least square	Propensity to trust	Propensity to trust
Briggs et al. (2004)	Experiment which required the creation of four versions of a travel insurance website. For both the personalized and non-personalized sites two false travel insurance companies were made. Participants were 107 students at the University of Northumbria, who were intending to spend some time travelling and who therefore had an interest in travel insurance	Analysis of variance	Personalization	Personalization has a limited effect on trust
Gefen and Straub (2004)	Study 1: 250 MBA students were instructed to go through the procedure of buying a textbook online, but not to actually purchase it Study 2: 171 MBA students were instructed to check for flights online and then book but not purchase them	Partial least square	Social presence *Online trust in this study in measured through integrity, predictability, ability, and benevolence*	Social presence influences integrity, benevolence, and predictability, but not ability
Koufaris and Hampton-Sosa (2004)	Experiential online survey with 212 students (USA) asked to browse a website they have not encountered before for information on a laptop	Linear regression analysis	Perceived company size; company reputation; perceived willingness to customize; perceived usefulness of website; perceived website ease of use of website; perceived security control; propensity to trust	Company reputation, perceived security control, willingness to customize (sig. at 0.01); perceived usefulness and ease of use of website (sig. at 0.05)

Bart et al. (2005)	Survey with 6831 respondents tasked to examine a particular website (websites selected for the study represented different categories). The study aimed at identifying determinants of trust in different types of websites (e.g., e-tailer, financial, travel).	Multigroup SEM analysis	Privacy protection guarantees, security assurances, navigation and presentation, brand strength, advice, order fulfillment, community features, absence of errors, familiarity	Some of the hypothesized indicators are statistically significant predictors of trust in some website categories. For instance, navigation and presentation are statistically significant in predicting trust in an e-tailer. However, of all the predictors identified, absence of errors is a significant predictor of trust in all types of websites
Chen (2006)	Experiential online survey with 300 respondents (USA) tasked to interact with a travel website	Stepwise multiple regression analysis	Consumer characteristics (disposition to trust, attitude, online experience); website features (usability, functionality); calculus-based trust (company reputation); institution-based trust (situational normality and structural assurances); knowledge-based trust	Website features (usability, functionality); calculus-based trust (company reputation)
Flavian et al. (2006)	Online survey with 357 respondents instructed to choose a website they will analyze for the study provided that they had habitually made purchases there and the websites were well-known to users	Confirmatory factor analysis with EQS 5.7	Perceived website usability, satisfaction with the website	Perceived website usability, satisfaction with the website
Liao et al. (2006)	Mail survey with 446 participants (Taiwan) instructed to respond to the survey with a particular website in mind	Structural equation modelling using LISREL 8.5	Website appearance, content quality, specific content in the web, website technical adequacy	Content quality, specific content in the web, website technical adequacy
Casalo et al. (2007)	Online survey with 335 respondents asked to analyze websites that they have visited before and to evaluate them in terms of levels of trust, satisfaction in and perceived reputation of the website	Confirmatory factor analysis with EQS 5.7	Satisfaction with the website, perceived organizational reputation	Satisfaction with the website, perceived organizational reputation
Cyr et al. (2007)	Experiential survey with 185 students (Canada) tasked to browse an e-service website for buying concert tickets	Structural equation modelling using LISREL	Perceived social presence	Perceived social presence
Kuan and Bock (2007)	Survey administered to 246 real customers within the offline physical stores of a brick and click retailer	Partial least squares	Word-of-mouth within social network (perceived reputation), expected sanctioning power, offline trust (offline presence), expected sanctioning power (effectiveness of complaint measures)	Word-of-mouth within social network (perceived reputation), expected sanctioning power, offline trust (offline presence), expected sanctioning power (effectiveness of complaint measures)
Lauer and Deng (2007)	Online survey in which participants were presented with a case of being asked to supply personal information to an online organization	Structural equation modelling using LISREL	Strong privacy policy	Strong privacy policy
Teo and Liu (2007)	Online survey using a hypothetical purchasing scenario for the context of the survey with 544 respondents from the USA, 1381 from Singapore, and 988 from China	Multiple group confirmatory factor analysis using AMOS 4	Company reputation; perceived company size; level of multichannel integration; system assurance of an organization; propensity to trust	Company reputation; system assurance; propensity to trust
Tan, Benbasat, and Cenfetelli (2008)	Online survey with a panel of e-government participants. Participants were to recall an e-government website that they frequented and to provide evaluations based on their transactional experience with the website	Structural equation modelling	Perceived ease of use, perceived ability, perceived benevolence, perceived integrity	Perceived ease of use (sig. at 0.001); perceived ability (sig. at 0.05); perceived benevolence (sig. at 0.05); perceived integrity (sig. at 0.001)
Experiments				
Hassanein and Head (2004)	One-factorial experiment manipulating three levels of website (low, medium, and high social presence) with 3 independent	Structural equation modelling using LISREL	Perceived social presence	Perceived social presence

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Table 1 (*continued*)

Study	Methodology	Analytic techniques	Hypothesized determinants of online trust	Statistically significant determinants of online trust
	groups, with each group composed of 26 participants tasked of purchasing a shirt online			
Pan and Zinkhan (2006)	Experiment 1: 2 (absence vs. presence of a privacy policy) × 2 (high vs. low privacy risk) between-subjects factorial design with 60 students (equally assigned to high and low risk conditions) placed on a situation of buying online that requires them to share personal information Experiment 2: The procedure of the first part of Experiment 2 is the same as that of Experiment 1, except that the e-store's privacy statement is a between-subjects factor with three levels: Absence of a privacy policy and the presence of a privacy policy in two levels (long and legalistic vs. short and straightforward). Ninety participants were randomly assigned to each of the six treatment levels	Analysis of variance	Presence of a privacy statement	Presence of a privacy statement

Study	Methodology	Significant findings related to the determinants of online trust
Qualitative approach		
Sillence, Briggs, Fishwick, and Harris (2004)	Fifteen women at various stages of menopause participated in the study. They were instructed to search for information about menopausal in the Internet. During their interaction with websites, they were asked to record their perceptions of the websites visited for the discussion with the facilitator	Websites that are poorly designed were less trusted Pieces of information that are unbiased and are supported by research articles or original sources were trusted
Sillence, Briggs, Harris, and Fishwick (2007)	Thirteen people diagnosed with hypertension were observed searching for information and advice online over a 4-week period. Participants used the Internet to search for information and advice on hypertension, followed by a group discussion with a facilitator	Participants usually referred to content rather than design when describing the sites they trusted most. Participants were more likely to trust websites that have good reputation – meaning sites that they have heard before instead of site that they just found through a search engine

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the color layout of the interface is important in augmenting customers' perception of the online banking's trustworthiness. Colors of low brightness and those that were used symmetrically induced feelings of trustworthiness, while bright colors that were used asymmetrically resulted in a decreased perception of the system's trustworthiness. Since the said study was conducted within a very specific context, one should be cautious in generalizing the effects of colors on online trust.

5.4. Social presence cues

The virtual nature of online transactions characterized by a deficiency in face-to-face contact and visual cues poses a hindrance to the germination of online trust among Internet users (Ridings, Gefen, & Arinze, 2002). Replicating a physical interaction with its sets of interpersonal cues in the context of online exchange may be a feasible method to promote online trust. We postulate that the infusion of social presence in websites for online transactions may increase users' trust in online organizations.

Social presence refers to the degree of salience of the person in the interaction and the consequent salience of the interpersonal relationships (Short, Williams, & Christie, 1976). Within the context of online interaction, social presence can be viewed as the degree of feeling, perception, and reaction of being connected by computer-medicated communication to another intellectual entity through a text-based encounter (Tu & McIsaac, 2002).

The degree of social presence is determined not only by the characteristics of the medium and users' perception (Tu, 2002a; Tu & McIsaac, 2002), but also by users' activities (Tu, 2002a). Perception of online social presence can be influenced by social relationships, trust, user's characteristics and perceptions of online environments, attributes of the communication media, user's computer literacy, use of paralanguage and emoticons, communication styles, task types, and privacy (Tu, 2002b). Social presence has a positive impact on users' identification with online groups and communities (Schimke, Stoeger, & Ziegler, 2007) and on their intention to participate in online interactions (Tu & McIsaac, 2002).

Gefen and Straub (2004) underscore that although a website is devoid of actual human interaction, the perception that there is social presence increases online trust. This suggests that the perception of social presence in a website with its resemblance to an interpersonal interaction is probably important in e-commerce, even though customers usually interact with the site rather than with a flesh-and-blood salesperson. A couple of empirical studies (Cyr, Hassanein, Head, & Ivanov, 2007; Hassanein & Head, 2004) show that perceived social presence positively impacts not only users' trust on the website, but also their perceptions of the website's usefulness and the enjoyment they can derive from using the site.

Efforts to heighten the perception of social presence in the websites of e-vendors primarily involved the use of photographs (Riegelsberger & Sasse, 2002; Riegelsberger, Sasse, & McCarthy, 2003; Steinbrueck, Schaumburg, Duda, and Krueger, 2002), although empirical studies yielded incongruent conclusions. Steinbrueck and colleagues (2002) reveal that using photographs in the electronic vendor's website is effective in creating social presence since the said strategy brings the impersonal nature of electronic transaction closer to face-to-face commercial exchange – thereby increasing an e-vendor's trustworthiness.

Riegelsberger et al. (2003), however, discover that the presence of photos on a website had no effect on online trust, admitting that there is no simple heuristic on the types of photos that could increase online trust. In another experiment, Riegelsberger and Sasse (2002) show that reactions to photographs on websites can range from suspicion to enthusiasm. While one group of users was positive about the inclusion of photographs on a website, others rejected photographs as they only cluttered the site and did not offer added functionality. Photographs were also considered as attempts at manipulating customers' online trust (Riegelsberger & Sasse, 2002).

5.5. Customization and personalization capacity

Customization implies that electronic vendors have the ability to tailor products, services, and transactional environments to their target users (Srinivasan, Anderson, & Ponnavolu, 2002). Existing literature tends to use the concepts of customization and personalization to denote the same thing. Therefore, points related to these two constructs in the context of trust in online transactions will be consolidated in this discussion.

Results of a study by Koufaris and Hampton-Sosa (2004) show that the willingness of online organizations to customize their products and services were significant antecedents to people's initial trust in them. The researchers argue that online organizations with customization or personalization capabilities can be considered as capable of serving their clients better.

Briggs, Simpson, and De Angeli (2004) hypothesize a reciprocal relationship between trust and personalization. Trust is not only a prerequisite for a good personalization practice; good personalization is also a condition for the formation of online trust. However, the results of their survey show that personalization only had a relatively small impact on trust-creation.

The shortage of research studies on the capacity of online organizations to personalize or customize is an invitation for further investigations to see whether the aforementioned construct contributes to the development of online trust. Personalization can also have a detrimental effect on trust formation since it requires the collection of personal information, directly or indirectly, from Internet users. Concerns for online privacy could adversely influence the impact of personalization on online trust formation. However, these propositions would be a starting point in understanding whether or not personalization really influences online trust.

5.6. Privacy assurances and security features

It has been mentioned previously that first-time online customers have greater concerns about the security of online transactions than their experienced counterparts (Koufaris & Hampton-Sosa, 2004). When customers evaluate the trustworthiness of an organization online, privacy and security are taken as vital criteria in the assessment (Aiken & Bousch, 2006).

Privacy concerns have been pointed out as a significant factor for customers to trust or distrust e-commerce (Hoffman et al., 1999). These concerns include receiving spam mails, being tracked for their Internet usage history and preference through cookies, having their confidential information accessed by third parties through malicious programs, and being at the mercy of companies with the prerogative on how to use customers' personal data (Wang, Lee, & Wang, 1999).

In one survey (Lauer & Deng, 2007), it is known that the introduction of stronger privacy policies in a company's website results in a higher perception of the company's trustworthiness. A number of studies (Arcand, Nantel, Arles-Dufour, & Vincent, 2007; Jensen, Potts, & Jensen, 2005; Vu et al., 2007), however, reveal that most Internet users do not even bother to consult or read online organizations' privacy statements before disclosing their personal data for different online transactions.

An experiment by Pan and Zinkhan (2006) reports that the mere presence of a privacy policy would be sufficient to persuade Internet users that an online organization can be trusted and would be expected to respect and protect their personal data. To understand this behavior we should refer to the Elaboration Likelihood Model. ELM postulates that people are motivated to hold correct attitudes but the amount and nature of issue-relevant elaboration in which

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they are willing to engage to evaluate a message vary with the individual and situational factors. Therefore, as the motivation and/or the ability to process messages and arguments decreased, peripheral cues, such as the presence of a privacy statement on a website, become important determinants of persuasion (Petty & Cacioppo, 1986), specifically the determinants of the trustworthiness of an online organization.

Another study shows that transaction security significantly affects online trust (Yoon, 2002). This finding is also highlighted in the study of Belanger, Hiller, and Smith (2002), which cites that respondents ranked security features as more important than privacy statements, security seals and privacy seals. However, that same study found that the presence of one of these security and privacy features led to a desire, on the part of customers, for the others as well.

The researchers argue that although security is ranked higher than privacy, online organizations should seriously consider including strong privacy statements and security features to earn customers' trust. They attribute the pattern of the ranking (security higher than privacy) to the possibility that security features are better understood and easier to identify than privacy statements, which could mean different things to different people. Nevertheless, they also claim that these features may not be sufficient to earn customers' trust since other characteristics may also be of influence (e.g., the company's reputation, website cosmetics, and other website features).

5.7. Third-party guarantees

The application of third-party guarantees to bolster trust in online transactions with online organizations is in consonance with the concept of trust-creation based on the transference process (Doney et al., 1998). Doney et al. (1998) argue that the formation of trust through transference process requires the identification of proof sources and the establishment of links between the known entities or proof sources (third parties) and the unknown ones (online organizations that the third-party recommends as trustworthy), provided that those third parties that act as proof sources are themselves trustworthy.

Certifications from trusted third parties may compensate for an e-vendor's lack of transactional history with its customer, especially in the initial encounter (Koehn, 2003). Third-party recognitions – in the form of seals of approval such as TRUSTe or BBBOnline – are effective in promoting customers' trust in online shopping. Such seals of approval help in endorsing the privacy and security policies of electronic vendors (Cheung & Lee, 2006).

Kimery and McCord (2002) distinguish three types of third-party assurances: privacy assurance, process assurance, and technology assurance. Privacy assurance gives information about the organization's compliance with privacy policies, while process assurance emphasizes the organization's observance of standards on internal business processes or order fulfillment. An indication of an online organization's use of technologies that enable secure and reliable order and payment handling is referred to as technology assurance. Results from their study on third-party assurances in online transactions, however, show that third-party assurance seals had no significant effect on customers' view of the e-vendor's trustworthiness. They further that participants' relative unfamiliarity with third-party assurance seals could explain for the absence of effects.

6. Company/organization-based trust antecedents

6.1. Organizational reputation

The existence of a positive organizational reputation results in a more open and trusting relationship between clients and organizations, whereas the opposite is true if the reputation is negative (Smeltzer, 1997). Since reputation stems from organizations' trustworthy behaviors (Hosmer, 1995), repeated failures on the part of organizations to fulfill their intentions could eventually result in the depreciation of their reputation (Herbig, Milewicz, & Golden, 1994).

The definition of reputation within the electronic commerce paradigm can be understood in these two points. First, it is a collective measure of trustworthiness based on referrals or ratings from members in a community (Josang, Ismail, & Boyd, 2007). Second, it is an indication of an organization's credibility, which results from the comparison between what an organization promises and what it actually fulfills (Casalo, Flavian, & Guinaliu, 2007). Three important factors precipitate the formation of a positive online reputation: through positive exposure, through third-party assessments such as the rating services proliferating on the web, and indirectly through the linking of websites (Toms & Taves, 2004).

The construction of a positive online organizational reputation can also be anchored on the collection of Internet users' reviews and feedbacks on their experiences with online organizations (Resnick, Zeckhauser, Friedman, & Kuwabara, 2000). Pieces of second-hand information, such as feedbacks from friends and word-of-mouth comments from other customers, can also impact users' online trust (Walczuch & Lundgren, 2004). Thus, online organizations that allow their clients to post reviews on purchased products, for instance, can be regarded as promoting trust (Koehn, 2003).

Results of a number of empirical studies reveal that the positive reputation of an e-vendor (Chen, 2006; McKnight et al., 2002; Teo & Liu, 2007) and word-of-mouth within one's social network, particularly positive referrals, (Kuan & Bock, 2007) significantly influenced clients' trust in online organizations. Customers who do not have previous experience with an online vendor also rely on the reputation of that vendor, which the former can use to assess the trustworthiness of the latter (Chen, 2006; Kim, Ferrin, & Rao, 2003; Koufaris & Hampton-Sosa, 2004; McKnight et al., 2002). Within the e-health context, users are more likely to trust websites owned by well-known and well-respected organizations (Sillence et al., 2004, 2007).

6.2. Perceived size of the organization

Jarvenpaa, Tractinsky, and Vitale (2000) claim that the perceived size of e-vendors shapes customers' view of that vendor's trustworthiness. They also add that the item customers intend to purchase has a bearing on the effect of the perceived size of the electronic shop – primarily considering the price of that item and the processes involved in the purchase as important constructs that define the influence of perceived size on online trust.

In an online survey by Teo and Liu (2007), however, an e-vendor's perceived size did not have a bearing on customers' trust. After all, as compared to assessing the size of a shop in the physical world, it is difficult to judge the size of an e-vendor through its website.

6.3. Offline presence

The Internet propelled the branching out of retailing channels from bricks-and-mortar to pure clicking, which eventually evolved into brick-and-clicks (Ranganathan, Goode, & Ramaprasad, 2003). With the difficulty on the part of Internet users to trust most online transactions, it can be presumed that online companies with offline presence are in a better position to promote the trustworthiness of their clients' online transactions with them.

Kuan and Bock (2007) reveal that customers' trust in the offline presence of the online retailer enhances the customer's online

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trust. They add that customers rely on their offline experiences with the online retailer's physical store as an information channel to build trust.

However, results of an online survey by Teo and Liu (2007) show that retailer's offline presence, referred to in the aforementioned survey as multichannel integration, is not significantly related to online trust. They argue that the absence of relation between the two constructs could be due to the low prices of product purchased online, minimal efforts on increasing integration level, and customers not having a clear concept of the integration of communication channels.

6.4. Experience and familiarity with the online company

People are usually ready to trust those whose trustworthiness has been tested and those who did not fail them before (Sztompka, 1999). This assertion accentuates the relevance of experience in trust formation. Internet users' experiences with online transactions can be positioned in a negative-positive spectrum. The online shopping experience can be enjoyable, gratifying, or satisfying; just as it can also be frustrating, disappointing, or discouraging. Pavlou (2003) contends that a positive relationship exists between customer satisfaction and trust, since customers who are satisfied with their online shopping experience tend to trust the electronic vendor for a possible second transaction.

A number of empirical studies (Casalo et al., 2007; Flavian et al., 2006; Yoon, 2002) reveal that customers' satisfaction with their previous transactions with a particular online company determines their trust in the company. Satisfaction with previous online transactions affects not only users' trust but can also induce greater usage and familiarity (Yoon, 2002).

Mollering (2006) contends that familiarity is imperative in the cultivation of trust, since trust is only possible within a familiar world (Luhmann, 1979, p. 20). The relation between familiarity and trust is grounded on the premise that trust in people and organizations develops when they behave in accordance with trustees' positive expectations of them (Gefen, 2000). Gefen's (2000) experiential survey shows that familiarity significantly influenced online trust, just as it determines clients' online behavioral intentions such as intention to inquire about a product and intention to buy online.

7. Discussion, conclusion, and future directions

The success of an online service initiative, whether commercial or non-commercial, depends not only on the subjective benefits it brings but also on the level of trust users have on the aforementioned initiative, the technology used for service delivery, and the party behind the service. Knowing how online can be developed and maintained is imperative in an era when organizations increasingly rely on the Internet for the delivery of their goods and services. Failure on the part of those organizations to acquire their clients' trust could significantly thwart users from engaging in online transactions with the organizations.

Different empirical studies on online trust consider different antecedents or determinants of online trust, primarily, in the context of online commercial exchanges, and secondarily, in the context of online non-commercial transactions. The development of online trust can be influenced either by users' experience with the technology used for the transaction or just by their tendency to trust (client-based trust antecedents) or by the quality of the website used for the transaction or the presence of security assurances on the website (web-based trust antecedents) or by their experiences with online organizations or by the reputation of those organizations (organization-based trust antecedents).

However, our review of the empirical studies on trust antecedents exposes contradicting results. For instance, while one study showed that using photographs to increase perceptions of social presence influences online trust, another study offered a totally different conclusion. Disparities in results imply that the effects of some online trustworthiness cues on trust formation do not transcend contextual differences and are, therefore, relative and could depend on the context of a particular online transaction and the parties involved in the transaction.

Such divergence in research results has strong implications for future research interests, both in the contexts of online commercial exchanges and non-commercial transactions. It is, therefore, justified to assert that the possible effects of different trustworthiness cues on the development of trust in online transactions according to different contexts are issues that merit further investigation.

The findings of this paper will be useful not only for people involved in the implementation, design and management of infrastructures for online services, but also for academics and researchers engaged in the study of online trust. We firmly believe that knowing the different determinants of online trust would substantially help professionals in designing websites for online transactions that would be highly trusted. Understanding some of the determinants of trust in online economic exchanges could also inform research interests in online trust within e-government and e-health. For instance, website features or characteristics important for the formation of online transactions with government agencies could be explored.

Important points acquired from a review of different empirical studies on online trust in various contexts served as bases for our recommendations for possible research agenda. Only a handful of studies cited in this paper used a comprehensive model in predicting the factors that contribute to the development of Internet users' trust. Using a more complete framework that incorporates all possible personality-based (e.g., experience with the Internet and with online transactions), socio-psychological (e.g., propensity to trust, perception of risks involved in the exchange), sociological (e.g., reputation, third-party certification), socio-cultural (e.g., culture, education), and technical (e.g., website quality) factors would be very beneficial in empirical attempts at understanding online trust development.

Studies on trust in e-commerce have not given so much attention on the influence of risk perception on trust formation, as shown by the studies that are reviewed in this article. Since risk intertwines with trust, the influence of the latter on the formation of the former could not be discredited. The reality of online risks, primarily the possible loss of online privacy in the case of e-government transactions, for instance, could significantly influence online trust. Thus, including risk perception in a model that aims at determining online trust determinants would result in a more exhaustive theoretical framework of online trust.

There is also an apparent imbalance between studies on trust in e-commerce and trust in non-commercial transactions, such as those in e-government and e-health. While it has been accentuated that trust is crucial in the adoption of e-government services, available studies on trust in that area are still very few, compared to the sizeable number of similar studies in the e-commerce context. Even those trust studies in e-government have not really investigated the determinants of online trust in e-government transactions. The case of trust studies in e-health is similar to that of e-government, as published papers of empirical studies on trust in e-health are also considerably limited. This indicates that trust in the aforementioned area is still on its infancy phase.

Although e-commerce, e-government, and e-health are substantially different in terms of the nature of their operations and their services and in terms of their target clients, their similarities lie on their dependence on the Internet technology for the delivery

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of their services to their clients. This significantly contributes to the facelessness and intangibility of online transactions, and thereby fuelling heightened perceptions of online risks that could discourage people from doing things online. These commonalities could sufficiently justify our assertion that a comprehensive model that aims at determining trust antecedents in electronic commerce is also applicable in understanding trust formation process in non-commercial online transactions, such as those in e-government and e-health.

Even if online trust research in e-commerce has somehow reached its level of maturity, as evidenced by the profusion of empirical studies, research in this domain is not yet saturated. A number of factors still merit attention. Questions such as such 'how do cultural differences influence online trust' and 'does person's economic standing impact his disposition to trust within the context of online commercial exchanges' can be logical catalysts for further studies on trust in different online transactions.

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