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Abstract

Infomediaries are information intermediaries in the Internet that play an important part in reducing online customers' search costs for finding the most suitable vendors and products. This research explores the process of Web customers' trust building using infomediaries. Specifically, we identify four sets of trust-related beliefs that impact web customers' trust attitude and intended behavior, as well as the antecedents of trust-related beliefs. This conceptualization is built on a number of theories, mainly theories of trust, reasoned action, and actor-network. Our empirical results in testing the model indicate that web customers' trust attitude toward web infomediaries is formed based on their beliefs regarding risk, content quality, system quality, and trust-building beliefs. We also found that initial trust is the antecedent of trust-forming beliefs, whereas individuals' propensity to trust influences their calculative risk beliefs. The implications of these findings are also discussed.

Keywords: Infomediary, trust, initial trust, trust-related beliefs

Introduction

With the growth of the World Wide Web, business-to-business and business-to-consumer transactions may surpass $7 trillion in 2005 (Grover and Teng 2001). Despite the size of the phenomenon, many customers are wary of participating in the Web environment (Hoffman et al. 1999). Therefore, attracting and retaining customers is a vital issue. Trust plays a critical role in the Web environment (Gefen et al. 2003) because of the existence of risk, uncertainty, or interdependence (Bhattacherjee 2002). Indeed, Sager et al. (2002) found that Web customers' loss due to fraud has increased to an average of $636 per customer in 2001, which has made fraud a sensitive issue in the Internet market (Ba 2001). Hence, an understanding of the process of trust formation is critical to the success of e-commerce and Internet use. In this research, we argue that Web customers' trust is a particularly critical factor in the success of infomediaries because Web customers' *use* of the information they provide depends to a large extent on their customers' trust that they provide unbiased, undistorted, and valuable information.

The motivation for focusing on infomediaries is that they are a significant business medium on the Web, having replaced traditional middlemen in providing, processing, and validating information regarding the increasingly large number of suppliers in order to facilitate transactions (Grover and Teng 2001; Sarkar et al. 1998). "The emergence and growth of the so-called 'infomediaries' such as <autobytel.com> and <carpoint.com> in the automobile industry, <avviva.com> in real estate, <austinlrs.com> in legal services, and <healthcareadvocates.com> in medicine evidence the impact of these institutions on the functioning of conventional markets" (Chen et al. 2002, p. 412).

There are number of definitions for the term *infomediary* (Chen et al. 2002; Grover and Teng 2001). We define an infomediary as a referral agent that provides Web customers with invoice prices, product specifications, reviews, and opportunities as well as getting price quotes and other information from providers. The infomediary has a number of characteristics that make it appropriate for examining trust issues in the Web environment. First, the infomediary is "a new Internet business model that

applies to firms that help customers deal more efficiently and effectively with online vendors. In e-commerce, it functions as a third-party provider of unbiased information and as a business matchmaker" (King 1999, p. 58). Web customers would be able to get various unbiased information about online vendors that may not have established name recognition, hence increasing customers' choice and bargaining power. Second, the use of information (the main fare of infomediaries) for decision making relies to a large extent on Web customers' trust in the infomediary. Infomediaries become successful mainly on the repeated and almost habitual use of their information (as opposed to one-time sale of a product). They need to build a loyal following through fostering trust in the quality and integrity of the information they provide. The use of information provided by an infomediary for making purchase decisions resembles watching your favorite TV news program or consulting with your favorite healthcare provider. They became your favorite information source largely because they succeeded in gaining your trust in the integrity and quality of information they provide. So should infomediaries if they aspire to become favorite sources of Internet information. Hence, the important role of trust in using infomediaries makes them an appropriate business type for exploring the process of online trust formation.

Using infomediaries as the focus of our research, we identify trust-related beliefs that influence Web customers' trust attitude and their intention to use infomediaries. In doing so, we rely on the theory of reasoned action as the overarching basis of our theoretical argument and synthesize it with theories of trust and actor-network and a number of other supporting theories to conceptualize our trust model. The model is tested through lab experiments and the results are reported and discussed in the subsequent sections. Our empirical findings indicate that trust-related beliefs include trustworthiness beliefs (a second-order construct), content-specific beliefs (a second-order construct), system-specific beliefs (in the form of ease of use), and risk beliefs. They have a significant impact on trust attitude toward infomediaries and the intention to use the infomediary. Furthermore, we observe that propensity to trust (a personal characteristic) and prior/initial trust (a second-order construct) are the antecedents of trust-related beliefs. Our results could be insightful for infomediaries in developing Web-design strategies that could enhance their customers' trust—a prerequisite for their success and longevity in the online market.

Theoretical Background and Research Model

We develop a conceptual model for exploring the trust formation in infomediaries as the delegates of Web customers. There exist a number of approaches in dealing with trust issues, which Lewicki and Bunker (1996) classify into three groups: individual personality, institutional phenomenon, and social transactions. We study trust from the perspective of social transactions and individual personality, especially domain-specific psychological state (Bhattacherjee 2002). The relationship is between a Web customer and an infomediary's Website. In the parlance of actor-network theory, infomediaries are *actors* who *stand in* and act on behalf of Web customers to reduce their risk in doing business with online vendors (Latour 1987; Walsham and Sahay 1999). By accumulating information about online vendors and by monitoring their activities business activities, infomediaries act as *delegates* whose points of view are those of their Web customers. These delegates are online entities created as an amalgamation of humans, social and business standards, and information technology. In order for the delegation relationship to work, Web customers need to trust their delegates.

Trust is considered an important determinant for a stable social relationship, the essence of an individual's behavior, thoroughly influential in interpersonal relationships, and a critical component of economic transaction (Jarvenpaa et al. 1998; Lewicki and Bunker 1996; McKnight et al. 2002; Schoolman et al. 1996). Mayer et al. (1995) have offered an integrative definition of trust by synthesizing multiple perspectives as "the willingness of a party [trustor] to be vulnerable to the action of another party [trustee] based on the expectation that the other [trustee] will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party [trustee]" (p. 712). In the case of infomediaries, Web consumers are trustors and infomediaries are trustees, since Web customers delegate a number of decision-making functions, such as searching, matching, evaluating, and monitoring of online vendors to infomediaries. Moreover, Web customers have limited ability to monitor or control the behavior of infomediaries and their use of Web customers' private information. Furthermore, compared to other online vendors and providers, infomediaries as actor-delegates may need to generate a higher level of trust on the part of their Web customers, which make the study of trust formation in infomediaries more compelling and illuminating.

Trust as an Attitude

There are different views about trust as belief, attitude, intention, and behavior (Mayer et al. 1995; McKnight et al. 1998). Trust in infomediaries should be distinguished from Web customers' general propensity to trust. As Bhattacherjee (2002) has observed,

trust as a personality trait is a relatively stable characteristic, which is formed by an individual's life experience and social environment. "In contrast, psychological states are affective or cognitive episodes that fluctuate with situational contexts and may be influenced by the person's interaction with a situation" (Bhattacherjee 2002, p. 213). Following Whitener et al. (1998) and Bhattacherjee, we view Web customers' trust in an infomediary as a domain-specific psychological state. This state is manifested in Web customers' attitudes, which are formed by their beliefs that the infomediary (the trustee or delegate) will behave in a certain way. Thus, we view trust as an attitude, and focus on identifying the process by which Web customers form their trusting attitude toward infomediaries.

Theory of Reasoned Action

Using the theory of reasoned action (TRA) (Fishbein and Ajzen 1975), we argue that the strength of the trusting attitude depends on Web customers' trust-related beliefs in delegating information gathering and processing tasks to infomediaries and using their advice and information in decision making. The TRA assumes that individuals behave rationally and identifies the psychological determinants underlying volitional behavior (Fishbein and Ajzen 1975). This theory postulates that individuals' intentions are determinants of their behavior, where intention is assumed to reflect the individual's motivations for a behavior. Intention is a function of attitude that reflects feelings of favorableness or unfavorableness toward performing a behavior (Ajzen 1985). The attitude toward behavior is in turn the function of beliefs. The individual's attitude toward a behavior is a function of personal beliefs. They refer to the individual's beliefs that the behavior leads to certain consequences. Therefore, the relationships proposed by the TRA can be summarized as Beliefs → Attitude → Intention → Behavior. Applied to our study, we argue that trust-related beliefs (and their antecedents) influence the trust attitude, which in turn determines the intention to use the infomediary, as depicted in Figure 1.
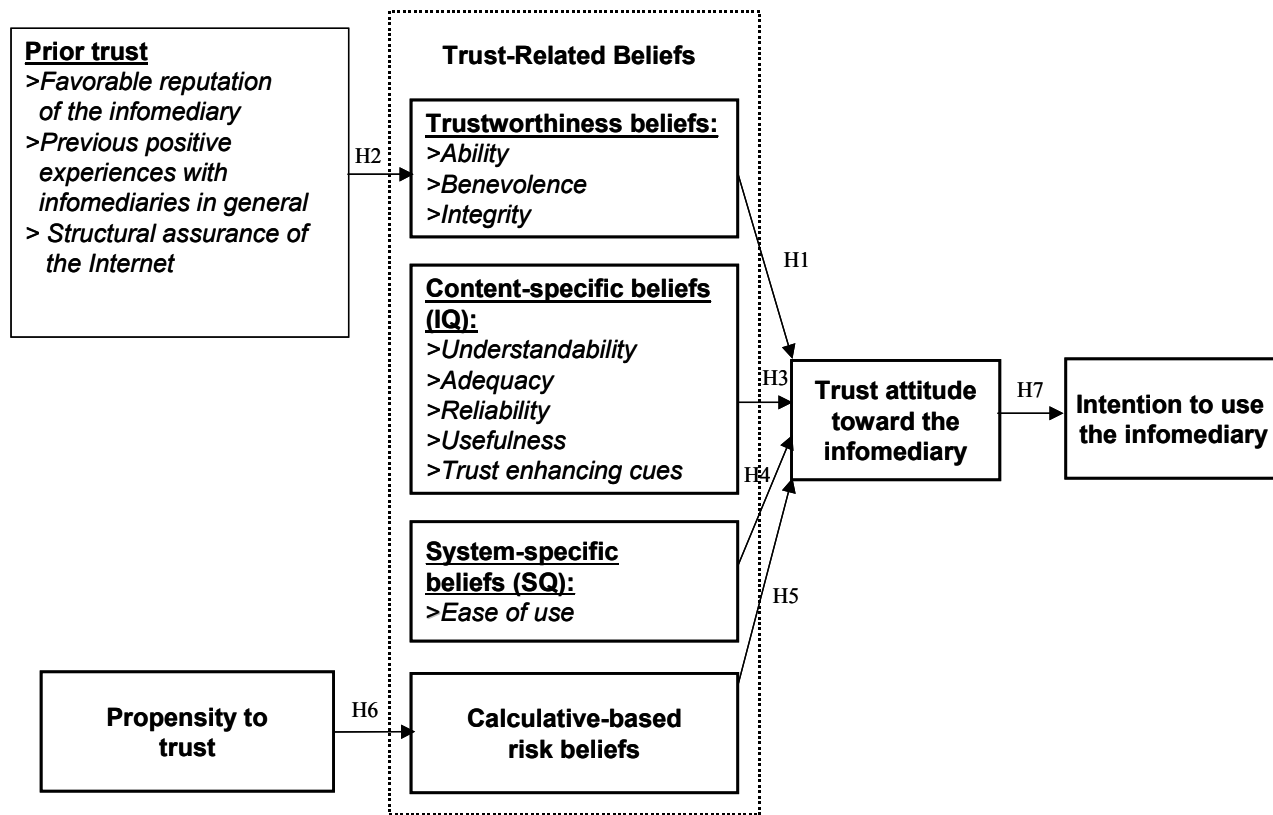

Figure 1. The Infomediary Trust Model

Most Web customers will go back to infomediaries on numerous occasions; Web infomediaries count on their return for developing lasting relationships through time in order to survive and prosper. Therefore, as in any relationship building, there are two stages of trust formation in infomediaries: the early encounters and subsequent changes as interactions are repeated through time. In this study, we focus on the process of trust formation in early encounters with infomediaries, and leave the dynamics of trust building to a subsequent study. In what follows, we use theories of trust and other related theories to identify and explore the role of trust-related beliefs (and their antecedents) in the formation of trust. We identify four categories of infomediary trust-related beliefs as trustworthiness beliefs, content-specific beliefs, system-specific beliefs, and calculative-based risk beliefs, and identify the antecedents of the beliefs as prior trust and individual's propensity to trust.

Trustworthiness Beliefs

The trust-related beliefs are complex with many components. The theories of trust have identified a host of general trustworthiness beliefs that apply to many circumstances. These beliefs include integrity, benevolence, competence, consistency, loyalty, openness, and predictability (Butler 1991; Mayer et al. 1995; McKnight et al. 2002). Based on an extensive review of prior work, Mayer et al. have classified these beliefs, and conclude that ability, benevolence, and integrity are major dimensions of trustworthiness that influence trust.

In accordance with the definitions by Bhattacherjee, by Jarvenpaa et al. (1999), and by Mayer et al., we define *ability* as the Web customer's perception of an infomediary's knowledge and competence in providing quality information. *Benevolence* is defined as the Web customer's belief that the infomediary cares about its Web customers and is motivated to act in their interests, beyond its own immediate profit motive (Jarvenpaa et al. 1999; Mayer et al. 1995; McKnight et al. 2002). *Integrity* in this study is defined as the Web customer's belief that the infomediary makes good faith agreements, tells the truth, and fulfills promises (Bhattacherjee 2002; Jarvenpaa et al. 1999; Mayer et al. 1995; McKnight et al. 2002). In summary, trustworthiness beliefs in the infomediary are the beliefs that the infomediary is able (ability), willing (benevolence), and honest (integrity) in helping Web customers in their search for finding their needed information. Based on Mayer and Davis (1999) and Whitener et al. (1998), we consider ability, benevolence, and integrity as dimensions of *trustworthiness*, which uses the second-order factor and impacts an individual's trust. Therefore, we hypothesize that:

> *Hypothesis 1.* Web customers' trustworthiness beliefs have a positive effect on their trust in the infomediary.

Prior Trust

Prior or initial sources of trust are factors that impact Web customers' trust prior to interaction with an infomediary. These sources together create a favorable or unfavorable prior disposition toward the infomediary. We identify three sources of prior trust, starting from what is specific to the infomediary, infomediaries as a group, and the institution in which infomediaries operate. These sources match closely with those identified by McKnight et al. (1998) as personality-based, cognition-based, and institutional-based.

Dimension 1: Knowledge-Based Source: Reputation of the Infomediary. The reputation of the infomediary is the knowledge-based source of trust. It reflects the social influence of trust, which is consistent with the point of view promoted by Schoolman et al. (1996) that trust-related studies need to start with a social influence point of view. Trust can be conditionally built upon social relations or social networks among actors (Hosmer 1995; Seibert et al. 2001). In the social exchange theory, social structure can shape one party's reputation based on a third party's ability to tell stories about one's trustworthiness (Rousseau et al. 1998). Furthermore, McKnight et al. (1998) recognize reputation as a categorization process for developing trustworthiness beliefs, and based on previous studies observe that reputation may reflect professional competence, benevolence, honesty, or predictability. In the context of the Internet, previous studies have found that reputation significantly influences trust in online retail stores (Doney and Cannon 1997; Jarvenpaa et al. 1999). Favorable reputation of an infomediary is an evidence for the repeated exchange of benefits, hence would be considered as the factor that biases Web customers in favor of the infomediary's trustworthiness. We argue that reputation is a dimension of the prior trust that impacts Web customers' trustworthiness beliefs.

Dimension 2: Cognition-Based Source: Prior Positive Experience with Infomediaries. The second source of prior trust is cognition-based, which produces the first impression of trust prior to engaging in interaction (Meyerson et al. 1996). The trustor may rely on categorizations such as group identification (or unit grouping) and stereotyping (McKnight et al. 1998). In the context

of infomediaries, a Web customer who has regularly purchased airline tickets by relying on Web-infomediaries to find the best ticket has the background to form the first-impression trust regarding an infomediary. Therefore, the depth and breadth of experiences in using various types of infomediaries increase a Web customer's ability to form stronger initial beliefs about the infomediary prior to interacting with it.

Dimension 3: Structural Assurance of the Internet: Specific to the Internet as an Institution. The third source of prior trust is institution-based. Institution-based trust requires the presence of an impersonal social infrastructure for enabling the establishment of trusting interactions (Zucker 1986), and is divided into structural assurance and situational normality (Gefen et al. 2003; McKnight et al. 2002). By structural assurance, we mean the presence of a historically well-established social infrastructure with necessary safeguards such as the existence of regulatory agencies, enforceable laws, guarantees, and well-established norms (Shapiro 1987). In our study, the institutional assurance is reflected in the perceived reliability of information on the Internet. Situational normality implies the presence of a normal working structure. Both categories of institution-based sources of trust are viewed to have their greatest impact on prior trust (McKnight et al. 2002). Of the two types of institution-based source of trust, we posit that structural assurance plays a significant role in forming Web customers' prior beliefs. Since infomediaries operate on the Internet, Web customers' perceptions about information reliability on the Internet color their beliefs regarding infomediaries.

We argue that the three dimensions of prior trust (reputation, experience, and structural assurance) are the dimensions of a second order construct that reflect Web customers favorable (or unfavorable) prior trusting disposition, which colors their beliefs regarding trustworthiness of the infomediary (Figure 1). Hence, we posit that

> *Hypothesis 2.*   *Web customers' high prior trust levels have a positive impact on their trustworthiness beliefs about the infomediary.*

Content-Specific Beliefs

Infomediaries need to provide evidence or proxy for the verification of their goals and actions in order to reduce Web customers' perception of risk. In any risk-taking behavior, the context in which the risk is to be taken plays an important part (Mayer et al. 1995). In the case of infomediaries, the information provided by an infomediary is the evidence of its goal as Web customers' delegate actor and constitutes the context for trusting behavior. Information quality is the single most important attribute of information for IT and Web-users; as shown by a number of studies (DeLone and McLean 1992; McKinney et al. 2002). Therefore, one can argue that Web customers may use the high quality of information supplied by an infomediary as a proxy for its goal alignment and proper actions as Web customers' agent/delegate. The infomediary's high information quality is the evidence for the presence of the shared goal with the Web customer.

Information quality is a higher-order construct, which has relevance, understandability, reliability, adequacy, and usefulness as its first-order dimensions (McKinney et al. 2002). These first-order dimensions could be used in measuring the infomediary's information quality. Furthermore, an infomediary's Website needs to contain trust-enhancing cues, which are designed to increase Web customers' trust. Such cues may include assurances for Web customers' privacy, third-party seal of approval, customer communities that reflect Web customer feedback, providing references from past and present users, and clear and easy to read privacy and security policies (Shneiderman 2000; Urban et al. 2000). These Web-element cues should be designed effectively in such a way that Web customers perceive them to be present. We argue that content-specific belief is a higher order construct that consists of information quality dimensions of understandability, adequacy, reliability, usefulness, and trust-enhancing cues. This second order construct is an extension of the *perceived usefulness* in technology acceptance model (TAM). Hence, we posit that

> *Hypothesis 3.*   *Web customers' positive content-specific beliefs about the infomediary's Website have a positive impact on their trust in the infomediary.*

System-Specific Beliefs

System quality of Websites has received attention in customer satisfaction as an important factor (Gefen et al. 2003; McKinney et al. 2002). Furthermore, one major dimension of system quality, ease of use, has been one of the two single most important constructs in the adoption of technology in TAM (Taylor and Todd 1995). In e-commerce, McKinney et al. (2002) report that

beliefs about system-level quality influence Web customers' satisfaction attitude. Furthermore, Gefen et al. (2003) report that perceived ease of use positively influences trust attitude in the e-commerce area. We, therefore, hypothesize that

>*Hypothesis 4.   Web customers' beliefs about the ease of use of the infomediary's Website has a positive impact on their trust in the infomediary.*

Calculative-Based Risk Beliefs

Trust requires a willingness to be vulnerable to the trustee's actions and "trust is the willingness to assume risk" (Mayer et al. 1995, p. 724). One source of trust is the extent of deterrence if the trust is violated (Lewicki and Bunker 1996; Shapiro et al. 1992). The calculative-based perspective of trust focuses on the risks and benefits of the trusting behavior. Perceived risk is a critical component of building interpersonal, social, and economic relationships (Chiles and McMackin 1996; Kini and Choobineh 1998).

In the relationship between Web customers and infomediaries, infomediaries could be considered as agents of Web customers in collecting and processing information relevant to a product, service, or entity. This information is needed to reduce the transaction cost associated with the uncertainty involved in selecting the right products or services. However, there is a perception of risk in using an agent. Agency theorists analyze economic relationships between principals and agents. "A principal-agent relationship exists when one party—the principal—contracts with another party—the agent—to perform a task involving delegation of decision making in exchange for compensation" (Whitener et al. 1998, p. 514). In this relationship, both parties try to maximize their utility and minimize risks associated with the relationship.

In the context of our study, Web customers strive to get the best information from infomediaries for decision making while minimizing the risk of misinformation. Hence, we define *net perceived risk* as Web customers' perceptions of net losses they may incur if the infomediary's information is incorrect. For example, in using an infomediary for cheap tickets, reliance on the infomediary may lead the Web customer to buy a more expensive ticket, and the benefit is finding information about the cheapest available tickets in a short time for free or at a low cost. For a Web customer for whom time is highly valuable, the net perceived risk of trusting the infomediary may be minimal, whereas for a Web customer with a very limited travel budget, the perceived risk of misinformation may mean inability to travel, hence would be relatively high. Therefore, we posit that

>*Hypothesis 5.   Web customers' perception of risk in using the infomediary has a negative impact on their trust in the infomediary.*

Propensity to Trust

From the personality-based trust perspective, McKnight et al. (2002) argue that "trust develops during childhood as an infant seeks and receives help from his or her benevolent caregiver" (p. 475). Propensity to trust is an individual trait that is invariant across context and situations (Mayer et al. 1995). It has been found to influence trust (Mayer et al. 1995; Jarvenpaa et al. 1998). We argue that the impact of personal propensity to trust on trusting attitude is mediated through perceived risk, in that Web customers' with natural propensities to trust have a lower perception of calculative risk in dealing with infomediaries, hence have a more trusting attitude toward them. We, therefore, posit that

>*Hypothesis 6.   Web customers' propensity to trust has a negative impact on their perception of risk in using the infomediary.*

Intension to Use the Infomediary

Based on the TRA, we argue that Web customers' trust attitudes influence their intention to use an infomediary, hence

>*Hypothesis 7.   Web customers' trust has a positive impact on their intention to use the infomediary.*

Research Method and Data Analysis

In this study, we report on the instrument development, the pilot study, and on the first round of data collection for checking the measures and for testing the model. The scales for measuring these constructs were developed based on a review of the literature to ensure the content validity of the instrument, as reported in Table 1.

Table 1. Construct Definition and Sources for Item Development

Constructs	Operational Definition from the Perspective of Web Customers	Sources for Item Development
Propensity to Trust	Tendency to trust	Jarvenpaa et al. (1998) Mayer and Davis (1999)
Favorable Reputation	Perception about the infomediary's favorable evaluation by others	Jarvenpaa et al. (1999)
Previous Positive Experience with Infomediaries	Positive experience in interacting with infomediaries in general	Developed in this study
Perceived Risk	Perceptions about losses incurred by using incorrect information provided by the infomediary	Jarvenpaa et al. (1999) Tung et al. (2001)
Structural Assurance	Perceived reliability of information in the Internet	Gefen et al. (2003) McKnight et al. (2002)
Information Quality–Understandability	The degree of clear, understandable, and readable information on the infomediary's Website	McKinney et al. (2002)
Information Quality–Adequacy	The degree of sufficient, complete, and necessary information the infomediary's Website	McKinney et al. (2002)
Information Quality–Reliability	The degree of accuracy, dependability, and consistency of the information on the infomediary's Website	McKinney et al. (2002)
Information Quality–Usefulness	The assessment of information that will enhance their performance	Gefen et al. (2003)
Information Quality–Trust Enhancing Cues	Perceptions about assurance for their privacy, third-party seal, and virtual communities	Developed in this study
Perceived Ease of Use	Perceived ease of using the infomediary's Website	Gefen et al. (2003) McKinney et al. (2002)
Ability	Perceptions about the infomediary's knowledge and competence in providing quality information	Bhattacherjee (2002) Jarvenpaa et al. (1998) Mayer and Davis (1999) McKnight et al. (2002)
Benevolence	Web customers' perceptions about the extent of infomediary's care about its customers	Bhattacherjee (2002) Jarvenpaa et al. (1998) McKnight et al. (2002)
Integrity	Web customers' perceptions of the infomediary's good faith and honesty in its dealings	Bhattacherjee (2002) Jarvenpaa et al. (1998) Mayer and Davis (1999) McKnight et al. (2002)
Trust	Web customers' favorable feelings toward the infomediary	Jarvenpaa et al. (1999) Mayer and Davis (1999) McKnight et al. (2002)
Intention to Use	The likelihood and willingness to use the infomediary	McKnight et al. (2002)

The research method was a laboratory experiment. We selected three successful infomediaries, BizRate.com, Kelly Blue Book, and MySimon.com, in order to increase the generalizeability of results. BizRate.com and MySimon.com provide information about thousands of online stores and millions of products, including price comparison, availability of the product in the online store, and online store rating based on customers' feedback. Kelly Blue Book is a specialized infomediary for cars that provides information about various vehicles including retail price, invoice price, and available options. In addition, customers can check the market values of their cars and also access information about insurance and car loans.

The instrument and experiments were validated and tested with 24 participants in the first pilot study. (Due to page limitation, the instrument is not presented here but is available upon request.) In the next round, 278 subjects evaluated three infomediary Websites. The participants selected one of three infomediaries to investigate a product or service of their choice (such as a DVD player, digital camera, or car). In order to ensure their serious engagement with the infomediary, the participants were asked to complete a customized list of information about the product (or service) of their choice, such as brand name, product rating, number of online stores carrying the product, the name of store where they would like to make the purchase, customers' ratings about the online store, product availability in the online store, and price of the product on the online store. The experiments required approximately 30 to 35 minutes to complete a task.

Participants were graduate or undergraduate students at a large business school in a southern university in the United States. Most participants were familiar with the Internet and had experience in buying products or services online. A study by the U.S. Department of Commerce (2002) reported that in September 2001, 54 percent of males and 54 percent of females in the United States used the Internet, and that 53 percent of the population in the 25-to-34-years age group used the Internet for online shopping. The average age of our participants (26 in pilot and 20 in main experiments) was relatively close to the lower end of this range. Furthermore, the GUV WWW survey (1998) characterizes Web-users as highly educated (88 percent had at least some college experience), which matches the educational levels of our participants (all college students) with relatively high levels of Web activities (with an average of 6 or 7 in the 0-to-10 range in the pilot and main experiments). Hence the type of participants in this study does not present a significant threat to external validity and could be considered as representative of the younger group of online shoppers. To increase the seriousness of participation, participants received extra credits and were entered in a lottery drawing.

Reliability and Validity

We first carried out the exploratory factor analyses to access initial validity that showed no significant cross loading except for structural assurance of the Internet. This dimension was removed from the analysis due to its strong correlation with the other two dimensions of prior trust. The results of exploratory factor analysis (EFA) indicated that there was no cross loading above .40 (McKnight et al. 2002). The normed χ^2 for EFA at the three levels of causality were 1.25, 1.11, and 1.62, respectively, well below the recommended threshold of 3, providing further evidence in support of discriminant and convergent validity. We also computed the correlations of items within each construct with the general question. The very high and statistically significant values of these correlations support the convergent validity of constructs. (Due to page limitations, the tables for the EFA results are available upon request.)

The reliability of first-order constructs were measured using Cronbach's alpha, composite factor reliability (CFR) and average variance extracted (AVE) and are reported in Table 2 below. All Cronbach's alpha values are well above the threshold of 0.70. Similarly, all CFR values are well above the cut-off value of 0.70 and all AVE values are well above the cut-off value of 0.50 (Segars 1997), together providing support for the reliability of constructs.

We also carried out confirmatory factor analysis (CFA) for establishing the convergent and discriminant validity. The CFA factor loadings, t-values, and item R^2 are reported in Table 3. (The software for the estimation of the measurement model and the SEM estimation of the research model was *Mplus* software developed by Muthén and Muthén [2001].) The high values for factor loadings support convergent validity for the constructs. Furthermore, the t-values for factor loadings of manifest variables were well above 2 as shown in Table 3, supporting the statistical significance of factor loadings (Muthén and Muthén 2001). The measurement model fit indices are reported in Table 4.

The normed χ^2 was 1.54, which is below the desired cut-off value of 3.0 (Krause et al. 2000). RMSEA was 0.04, which is below the 0.06 cut-off (Hu and Bentler 1999), indicating a satisfactory model fit. CFI and TLI indices were 0.94, both above the cut-off values of 0.90 for the continuous outcomes case (Bhattacherjee 2002; Hu and Bentler 1999; Krause et al. 2000). GFI is below the recommended threshold, but AGFI is 0.85, which is above the cut-off value of 0.80 (Gefen et al. 2000). These results suggest that the measurement model adequately fits the data.

Table 2. Reliability Measures for Model Constructs

Constructs	Cronbach's alpha	CFR[a]	AVE[b]
Propensity to trust	0.88	0.87	0.62
Favorable reputation	0.94	0.94	0.79
Previous positive experience with infomediaries	0.91	0.91	0.71
Perceived risk	0.92	0.92	0.70
Understandability	0.90	0.91	0.77
Adequacy	0.90	0.92	0.79
Reliability	0.91	0.92	0.80
Usefulness	0.88	0.88	0.71
Trust enhancing cues	0.90	0.92	0.80
Perceived ease of use	0.93	0.93	0.82
Ability	0.92	0.92	0.80
Benevolence	0.85	0.85	0.74
Integrity	0.94	0.94	0.89
Trust	0.93	0.93	0.76
Intention to use infomediary	0.95	0.95	0.82

[a]Composite factor reliability   [b]Average variance extracted

Following Doll et al.(1994) and Segars and Grover (1998), two first-order factors were used to create the second-order construct for prior trust, five first-order factors for content-specific beliefs, and three first-order factors for trustworthiness beliefs. R^2 values indicated an acceptable level of reliability for the second-order factors (Doll et al., 1994; Gefen et al., 2000). Except for slightly lower correlation values for trust-enhancing cues and prior positive experience, factors in the second-order constructs had very good R^2 values. Furthermore, significant factor loadings for second-order factors indicate their validity (Doll et al. 1994). In our study, the factor loadings and t-values for the factors in the second-order constructs were quite high, providing support for the acceptable validity of these constructs. (Tables for the analysis of the second-order constructs are available upon request.)

Furthermore, following the procedure suggested by Gefen et al. (2003), we assessed discriminant validity by comparing original measurement model (CFA) with eight latent variables against other measurement models with seven constructs, which included every possible combination of collapsing two constructs into one. The χ^2 value in the original CFA was significantly better than all combinations of the reduced measurement models. (The summary table containing these results is also available upon request.)

The fit indices of the estimated models suggested an acceptable fit to the data as reported in Table 4. The estimation results of the research including the estimated model parameters (standardized), their t-values, and R^2 values for constructs are shown in Figure 2. Our results show that, as hypothesized in H1, H3, H4, and H5, Web customers trust in infomediaries is significantly influenced by the four sets of beliefs, trustworthiness, content-specific, system-specific, and perceived risk, all with t-values well above 2, and the signs as hypothesized. The impact of trustworthiness and content-specific beliefs are more than the other two with coefficients .67 and .26, whereas the impact of system-specific beliefs and perceived risk beliefs are relatively low (0.08 and -0.05) in this study. We also found prior trust has a positive significant impact on trustworthiness beliefs (as hypothesized in H2) and propensity to trust has a negative impact on the perceived risk beliefs (H6). Web customers' intention to use the infomediary is strongly influenced by their trust in the infomediary.

Discussion and Conclusion

This study examined the process of Web customers' trust building in infomediaries. Our empirical evidence provided support for the proposed conceptual model in which we postulated that there are four types of trust-related beliefs about infomediaries: trustworthiness, content-specific beliefs, system-specific beliefs, and perceived risk. These four sets of beliefs have significant

Table 3. Confirmatory Factor Analysis: Measurement Model

Constructs	Items	Loading	t-value	R^2
Propensity to Trust	PT1	1.00	1.00	0.74
	PT2	0.92	21.58	0.79
	PT3	0.81	18.87	0.60
Favorable Reputation	FR1	0.92	25.99	0.70
	FR2	0.97	29.60	0.78
	FR3	0.93	31.36	0.82
	FR4	1.00	0.00	0.84
Previous Positive Experience with Infomediaries	PPE1	0.84	19.63	0.62
	PPE2	0.90	20.26	0.80
	PPE3	1.00	0.00	0.75
	PPE4	0.89	23.40	0.69
Perceived Risk	PR1	0.90	25.20	0.65
	PR2	0.91	23.74	0.73
	PR3	0.88	21.35	0.67
	PR4	0.91	25.41	0.68
	PR5	1.00	0.00	0.79
Information Quality–Understandability	IQUD1	0.83	21.85	0.68
	IQUD2	1.00	0.00	0.90
	IQUD3	0.92	23.74	0.76
Information Quality–Adequacy	IQA1	0.95	26.50	0.82
	IQA2	1.00	0.00	0.84
	IQA3	0.97	28.57	0.71
Information Quality–Reliability	IQRB1	0.92	22.02	0.78
	IQRB2	0.90	17.77	0.75
	IQRB3	1.00	0.00	0.88
Information Quality–Perceived Usefulness	IQUF1	1.00	0.00	0.70
	IQUF2	0.95	16.54	0.78
	IQUF3	0.92	16.56	0.64
Information Quality–Trust Building Cues	IQTC1	0.97	31.43	0.73
	IQTC2	0.93	27.85	0.79
	IQTC3	1.00	0.00	0.87
System Quality–Perceived Ease of Use	PEOU1	1.00	40.17	0.85
	PEOU2	1.00	0.00	0.90
	PEOU3	0.89	30.21	0.71
Ability	A1	1.00	0.00	0.84
	A2	0.95	26.17	0.87
	A3	0.95	22.34	0.69
Benevolence	B1	1.00	0.00	0.83
	B2	0.90	15.82	0.65
Integrity	I1	1.00	30.36	0.88
	I2	1.00	0.00	0.90
Trust	T1	1.00	0.00	0.80
	T2	0.94	19.64	0.75
	T3	0.96	24.42	0.74
	T4	0.99	24.70	0.76
Intention to Use the Infomediary	IU1	0.88	23.02	0.75
	IU2	0.92	36.48	0.91
	IU3	0.91	24.23	0.79
	IU4	1.00	0.00	0.83

Table 4. Fit Indices for the Measurement Model and Estimated Model

Goodness of Fit Indices	Measurement Model	Estimated Model	Recommended Cut-off
Normed χ^2 (χ^2/d.f.)	1.54	1.62	Below 3
CFI	0.94	0.93	Above 0.90
TLI	0.94	0.93	Above 0.90
GFI	0.85	0.84	Above 0.90
AGFI	0.84	0.83	Above 0.80
RMSEA	0.04	0.05	Below 0.06

(a) Coefficient of estimation and (t values)

(b) R^2 value of dependent construct
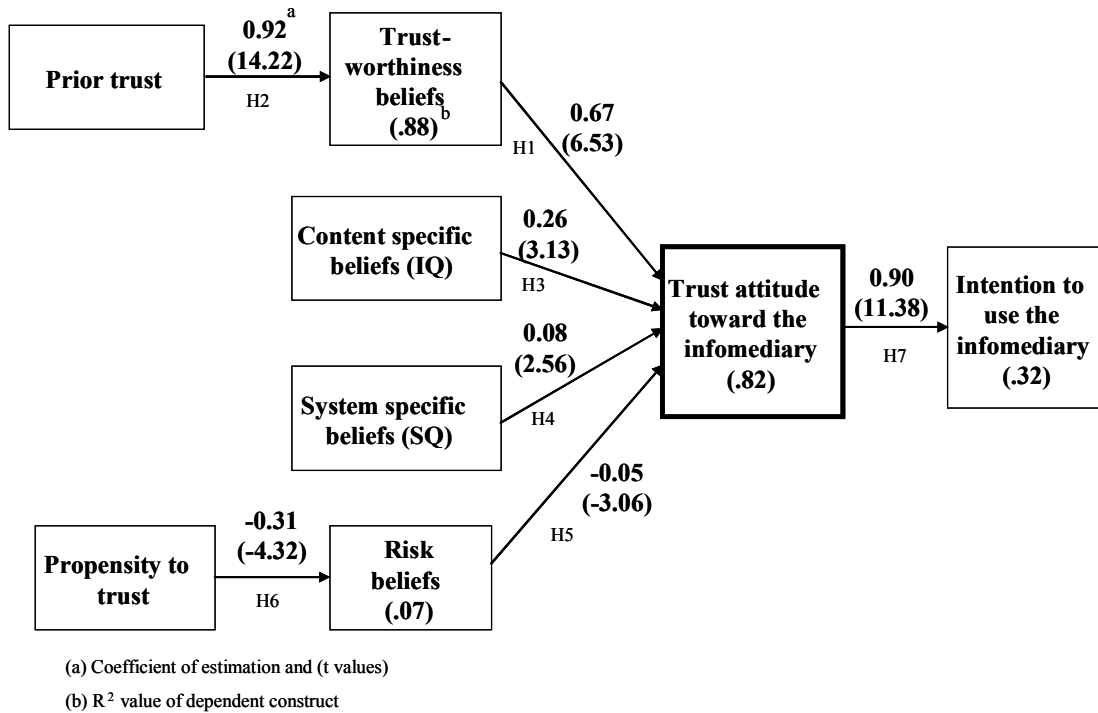
Figure 2. The Estimated Trust Model

influence on trust attitude toward an infomediary, which in turn significantly impacts the Web customer's intention to use the infomediary. Furthermore, we identified two sets of antecedents for the trust-related beliefs. The first is prior trust (with the dimensions reputation of the infomediary and previous positive experience in using infomediaries), which influences trustworthiness beliefs. Additionally, the propensity to trust (an individual characteristic) impacts trust attitude through the perceived risk, in that a personal tendency to trust leads Web customers to have a lower perception of the risk involved in using the infomediaries, hence enforcing Web customers' trusting attitudes.

Our findings have significant implications for infomediaries. Trustworthiness beliefs have the greatest impact on Web customers' trust. Hence establishing a reputation for being capable of providing the best unbiased information is the most important factor in the success of infomediaries. The second most important factor is the information quality of these Websites in terms of understandability, adequacy, reliability, and usefulness as well as trust enhancing cues. Hence the best business strategy for Web infomediaries is to provide high quality information that has been shown to be unbiased and above-board—a time-honored strategy for the long-term successful business. We also found that structural assurance of the Internet in the group from which we collected data is not a distinguishable factor. While this could have been due to our measurement, it is also possible that the younger generation has a uniformly high level of trust in the Internet as an institution and does not consider its structural assurance

a relevant concern. Another interesting finding is that perception of risk, although significant in forming the trust attitude, has a relatively low level of impact (due to its small coefficient). This could be due to the nature of the experiments in that the participants might have searched for less expensive items and did not feel sufficiently at risk in using the infomediary. Therefore, they might have had confidence in the infomediary (Das and Teng 1998, 2001). Similarly, ease of use has a significant but lesser impact on trusting attitude. Therefore, if our results hold for the general population, infomediaries should first focus on marketing the quality of their information and the competency and honesty of their operation. Developing interfaces that enhance ease of use and reduce the perception of risk should be the second order of business.

This study also has theoretical implications. We provided a relatively simple and straightforward conceptual model for explaining the trust forming process in infomediaries, which could easily be extended to other types of e-commerce operations. Furthermore, our conceptual model could be a basis for developing the dynamics of trust-building relationships through time as Web customers continue to return to the infomediary. Trust attitude becomes more stable with repeated interactions. Such interactions take place over time, gradually building a relationship with the infomediary. Therefore, a possible extension of this study is to investigate the dynamics of trust building as the level of trust changes through a feedback process.

Our study has a number of limitations. The type of participants in our lab experiment limits the generalizeability of our findings to the younger Web customer age group. Furthermore, the size of our sample should be increased in the next round of data collection in order to improve the external validity of the results.

In conclusion, this study provides a framework for how Web customers form their trust in the early interactions with infomediaries. Our work sheds some light on the importance of trust-related beliefs, particularly the information quality and system quality of Websites. The model and subsequent findings could be helpful to both practitioners and researchers interested in trust formation. The next phase of our study will focus on more extensive data collection as well as the investigation of the dynamics of trust building.

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