UNIVERSITI TEKNOLOGI MARA

A CONCEPTUAL MODEL OF TRUST INDUCING FEATURES FOR WEB MEDIATED INFORMATION ENVIRONMENT IN SENSITIVE INFORMATION CONTEXT

EMMA NURAIHAN BINTI MIOR IBRAHIM

Thesis submitted in fulfillment of the requirement for the degree of Doctor of Philosophy

Faculty of Computer Science and Mathematics

April 2009
Candidate’s Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any other degree or qualification.

In the event that my thesis be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree and agree to be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

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ABSTRACT

Trust aspects of commercial transactions have long become embedded in the custom and practices within the e-tailing environment. However, consumers are not only involved in the interpersonal or inter-organizational transaction within the electronic exchange model but also in the knowledge transactions and exchanges within the information exchange mode. This research proposed the term web mediated information environment (W-MIE) by referring to the activities involved in acquiring, seeking and disseminating information on the web as a result of the growing number of informational websites. It is noted, trust in W-MIE is fairly new and risks associated with it are novel to users. Hence the aim of this research is to address on how to impose the sense of "legitimacy" in the design of an information artefact which can be rationalized and control as part of the overall interface design strategy and future information systems (IS) construction for sensitive context. Drawing the attention to the "soft" dimensions of trust, we seek to fill in the gap by explicate the role of trust from the institutional theory and semiotic paradigm to maximize the "goodness of fit" for future IS construction through the analysis of its social context, pragmatic and semantic levels of signification. We contend that institutional design features could make the alignment between formal and informal signs of trust to match their meanings through shared norms, assumptions, beliefs and perceptions. The conceptual model of Institutional Symbolism Trust Inducing Features and its four underlying dimensions (content credibility, emotional assurance, third party/seals of approval and brand/reputation) are developed to facilitate thinking and perception as how trust can be built and design through signs comprehension. The research uses psychological method to evoke user's mental model via card sorting technique to explore on users trust perception of institutional signs operationalized in web based information for Islamic content sharing sites. It was then further investigated for its semantical meaning via qualitative inquiry which uses the semi-structured interview technique. The results indicate the elements of content trustworthy (truth, validity), content legitimacy (lawful, evidential), content presentation (appearance, functionality), site benevolence (goodwill), site integrity (security application and enforcement), demonstrating user’s satisfaction, guarantees and safety nets, information practices, ethics (obligations), expertness (authority, knowledge) and familiarity (general business sense) which depicts the connotations of "online legitimacy". This thesis provides contributions in terms of construct development of online trust elements and theoretical generation within the domain of W-MIE and operationalized in the web based for Islamic content sharing sites which extend the literature of trust aspects and in the wider HCI scope to provoke further arguments and comparative judgments. The outcome will be benefits for designers design guidance for trust elements placement on the web, cultural embedded design features and effective security and privacy protecting behaviors for those who would want to involve in acquiring, communicating Islamic knowledge or information on the web.
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Praise be to Allah, the Most Gracious, the Most Merciful

I thank my teachers Assoc. Prof. Dr. Nor Laila Md Noor and Assoc. Prof. Shafie Mehad for their thoughtful and benevolent trust;

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I thank Him, Allah the Almighty, who trusted so much that He bestows mankind with the Noble Quran, an absolute authenticity and truth; incumbent upon all those who have known it, and who have enjoyed its taste and have been guided through its guidance;

And now, it's my turn-
    my turn to trust- thoughtfully, benevolently, thickly, blindly, selflessly and truthfully.

2009 EMMA NURAIHAN BINTI MIOR IBRAHIM
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CHAPTER 1

INTRODUCTION

1.1 Overview

This work links the social science theories of trust and semiotic principles to form the basis of our interpretive paradigm to the design of trustworthy information artifact on the web residing within the sensitive context environment. We refer the information artifact as an object (graphically or textually displayed on the web) to have some mandated specifications, meeting conventions or standards or possessing some kind of symbolic value to the user. The research key focal point is to refine our notions of the human computer interface within the Web Mediated Information Environment (W-MIE) context through the evolution of novel ways of assisting its design deployment and evaluation from non technical perspectives of requirements. This thesis addresses the earliest (conceptual) state of development work concerning the role of "soft" trust dimensions in imposing "online legitimacy", specific interface elements perceived as signals for trustworthiness governing interaction on the web. To guide us we have formulated for ourselves the goal of creating a framework to facilitate trust conceptualization and operationalization within W-MIE context via explication of institutional theory and semiotics paradigm. The framework we proposed, called Institutional Symbolisms Trust Inducing Features. The perspective of the framework is a descriptive one, since it categorizes the trust dimensions that act as communication embedded in cultural influence features to support the emergence of trustworthy behavior. The nature of the proposed data collection is rich and qualitative but also simple and intuitive. The techniques involve concentrating on what might be loosely called the general look and feel of an interface as well as detailed design elements such
as choice of specific content. We seek to anticipate (pre-align) an early application concept to a particular target audience to identify patterns of preferences for design characteristics by a specific group. The aim is to capture the users understanding on their de-coding of signs embedded in electronic interfaces. It is propose here that paradigm shift is needed from specification to discovery and from detailed requirements analysis of tangible known requirements to activity designs (intangible known) to uncover hidden or at least unarticulated or semi articulated user knowledge and needs. The overview of the thesis interests and how it is commences is as shown in Figure 1.1.
The research is interested in:

Designing information artefact for information in sensitive context websites within the Web Mediated Information Environment (W-MIE).

as communication (signs)
content

as culture (signs)
cognitive and affective interaction

to form "online legitimacy"

as communication

Institutional Theory Institutional Trust

in conceptualizing the problems
Institutional Symbolisms Trust Inducing Features Framework

in operationalizing the framework

Phenomenology of Trust within the web based information for Islamic content sharing sites

Context (e-Halal websites)

intricate values and human experiences

the comprehension of the meaning of signs and actions

in Interpretation

Discerning of patterns Discerning of themes

Card sorting (categorizations) Interview (semantic bindings)

Identification of elements and exploration of their connections

Similarity matrix (identifying communalities and uniqueness)

Content Analysis (categories, development of stories)

in representation

conceptual model development

Figure 1.1: Overview of the thesis interests and its approach
1.2 Problem background

Trust, its causes, nature and consequences is widely viewed as a vital foundation of human communication and interaction. As the Internet becomes more pervasive in our everyday lives, our social and economic lives now are governed by the ‘virtual’ world where interactions are mediated or executed with technology. We can now socialize (e.g. chat rooms, dating partners, online discussions), taking advice (e.g. legal online) and buy or sell goods on the Internet without ever communicating face to face (e.g. eBay).

In the information systems (IS) community and the wider human computer interaction (HCI) aspects, trust has been discussed widely in the context of e-tailing environment or known as the computer mediated exchange (CME) context (Bailey et. al., 2001). It focuses on e-commerce aspects particularly the business to consumer (B2C), business to business (B2B) and consumer to consumer (C2C) electronic exchange models. The importance of initiating, building and maintaining trust between buyers and sellers as key facilitators for customer retention and business longevity online is increasingly being recognized in academic as well as in practitioner communities varies in its conceptualization and multi-dimensional constructs (Kräuter et. al., 2006; Chopra and Wallace, 2002). However, these interactions involved different types and levels of risks that are either caused by the uncertainty of using open technological infrastructure for the electronic exchange or can be explained by the conduct of users who are involved in the exchange activities. Online transactions and exchange relationships are not only characterized by uncertainty but also by anonymity, lack of control and potential opportunism, making risk and trust crucial elements of e-commerce (Kräuter and Kaluscha, 2003). Interactions are only possible if users trust the system to communicate and transact as well as the organizations that provide them. Due to the nature of risks in the CME, many discussions of trust in the context of information systems (IS) often used the term rather loosely to refer to technologies such as encryption and communication protocols, cryptography and trusted information architectures (Grandison and Sloman, 2000; Pavlou and Gefen, 2004; Ratnasingam and Pavlou, 2004). In the IS literature, it is
known as the tangible trust comprising psychological studies, formal mathematical and
cognitive models of trust (Capra, 2004; Abdul-Rahman and Hailes, 2000; Neville and
Pitt, 2003) or hard trust dimensions (Kräuter et. al., 2006). It focuses on issues like
technical security and reliability (Schneider, 1999), why trust is needed (Urban et. al.,
2000), its antecedents and consequences (Jarvenpaa et. al., 2000; Gefen, 2000; Kini and
Choobineh, 2000; Einwiller et. al., 2000), barriers contributing to the lack of trust
(Hoffman et. al., 1999; Schoder and Yin, 2000), measuring the impact level of trust and
trustworthy behavior and possible remedies against it (Benamati et. al., 2006). The
emphasis is placed on the role of trust for e-commerce adoption and the short term
transactional values. In addition, current research of trust in HCI in the area of e-
commerce aspects often focused on establishing guidelines through quantitative studies
and large surveys for increasing the perceived trustworthiness of technology or that of
the actors it represents (Feng et. al., 2004; Egger, 2001; Nielsen et al., 2000;
Cheskin, 1999).

However, empirical research in this area is beset by conflicting conceptualizations of the
trust constructs, inadequate understanding of the relationship between trust and its
antecedents and consequents and the frequent use of trust scales that are neither
theoretically derived nor rigorously validated (Bhattacherjee, 2002). Moreover, efforts to
provide a theoretical grounding for trust in the IS context is still underdeveloped
(Chopra and Wallace, 2002). This confusion has manifested in studies that examine
isolated dimensions of the construct. An additional problem of design guidelines that are
based on self reports is that they are limited to current signifiers of trustworthiness in a
specific domain. These may not be stable over time, and they are not necessarily
transferable to other domains and technologies (Kräuter and Kaluscha, 2003). However
the Internet is growing as a marketplace not only for products and services but also on
information. Without realizing, consumers are not only involved in the interpersonal or
inter-organizational transaction within the electronic exchange model but also in the
knowledge transactions and exchanges within the information exchange mode (Forray,
2004) (see Figure 1.2).
The existence of websites that provide services on topics like career, relationship, medical, financial, legal information, religion and its practices and political are some of the evidences that the user nowadays are extending their web uses to access information about matters that affect their lives, also to establish personal and organizational connections. Some firms offer free advice (e.g. FreeAdvice.com, jobstreet.com.my, jobseekersadvice.com, WorldLawDirect.com, halaljakim.com.org) while others charge for their advice services (e.g. bankruptcymedia.com, legalserviceconnection.com). In this sense we coined the term web mediated information environment (W-MIE) to refer to the activities involved in acquiring, seeking and disseminating information on the web.

The notion of trust in information conforms to the interpersonal model of trust. It is a social attitude towards a technological artifact, in this case the electronic information or document such as web page or electronic article (Chopra and Wallace, 2002). A person may search for information to satisfy any of several needs: evidentiary support for a decision making process or as reference material for producing ones own or facts to supplement personal knowledge. Although the Internet is widely used and has become
the most effective communication tool and information provider, and have easy access to abundant sources but some limitations can be seen through the questionable quality of the information provided and the risk of getting false information (Marchand, 1990). Some researchers have explicitly raised the problem of trust in information obtained from the Internet (Alexander and Tate, 1999). Apparently, there is less control and gate keeping on the web than for print publications. Neither authoritarian governments nor institutions can screen all the information on the Internet due to its nature. Nearly anyone could publish on the Internet. However, less critical and uninformed people are more likely to accept an untruth as a truth (Hernon, 1995). Falsity on the web is seldom revealed because there is too much information. The more information is put on the Internet, the chance of discovering misinformation decreases. In addition, most people neither have time to verify its accuracy nor go back to the same site because the browser may fail to find it again (Calvert, 2001). Hence, deliberate users trusting decision to use their own knowledge to evaluate the information in its own terms.

Other issues like fraudulent behavior, forgery and pretense have obviously not suddenly been spawned by the virtual world. Questions concerning the original and the copy (Eco, 1992), not to mention the evaluation of goods that are the object of commercial transactions, have given rise to the problem of trust in the electronic mediated environments and have highlighted just how crucial trust building mechanisms have been to the functioning of markets and communities since the beginning of time. What is at stake here is the entire range of mechanisms that will facilitate interpersonal and inter-organizational transactions, given the new conditions for knowledge transactions and exchanges: increasing specialization, increasing asymmetrical distribution of information and assessment capabilities, greater anonymity among interculturators and more opportunities for forgery identity (Forray, 2004). Clearly new methods need to be devised to “certify” the knowledge circulating on the Internet within a context where inputs are no longer subject to control (Khan and Khan, 1999). Another big issue concerns regulation and social behavior and the formation of cooperation based upon trust and shared ethos/ identity in virtual context (Forray, 2004). This is because, trust
and culture are interconnected. The meaning, antecedents, and effects of trust are indeed determined by one’s culture (Doney et al., 1998; Fukuyama, 1995; Zucker, 1986). In the HCI literature, much of the initial research on consumer’s judgment of trust on information is conceptualized through its credibility perceptions (Fogg and Tseng, 1999; Metzger et al., 2003;) or quality indicators (Alexander and Tate, 1999) focuses in the domain of health (Constantinides and Swenson, 2000; Sillence et al., 2005), financial (Stanford et al., 2002), risks communication (Peters et al., 1997) and advice websites (McKnight and Kacmar, 2006). However some of the works are heavily criticized because the operationalization of trust was not understandable (Kräuter and Kaluscha, 2003). Compounding the problem circulating trust research within W-MIE is the fact that many of the scales used in the studies are mostly scientific, neither theoretically grounded nor authenticated.

1.2.1 Contextualizing the problems

Indeed, trust exercises on consumer behavior and decision making processes (Hirschman, 1982; Wilkes et al., 1986). However, given the varying results of previous studies on consumer’s trust assessment within the e-tailing environment, we are left wondering whether consumer’s trust evaluation on topics that are sensitive in context and to its cultural norms would give different connotation of trust and its guidelines such as religion. There is a longstanding interest in designing information and computational systems that support enduring human values (Friedman et al., 1997). The Internet spans the globe in all languages and cultures. Users and organizations communicate their business ideas, knowledge and information across vast distances. When people are engaged in the knowledge and information exchanges in the virtual world, it is critical to avoid misunderstanding and misinterpretations. Users must comprehend accurately the meaning of what is said. How things are said is as important as what actually is said. This is inhibited by differences in value systems, attitudes, beliefs, and communication styles. Such differences shall be taken into account in order to ensure that interfaces are usable and acceptable as the cultural background of users affects how they operate and
interact with an interface. The communication style one uses for generating ideas, exchanging opinions, sharing knowledge and expressing ideas is indeed cultural centric (Smith et al., 2003). However, these key issues rooted in deep cultural identities represented via the interface element within information context have not been fully explored and understood empirically. Some researchers have done work in the area of culture and design (Barber and Badre, 2001; Mooji, 1998; Matsumoto, 1994; Smith et al., 2003) but results have been either inconclusive or unrelated to develop an IS for information settings in sensitive context. Moreover there is no consensus as to how the trust construct should be operationalized (Bhattacherjee, 2002).

Moving away from the domineering trust issues in the e-tailing environment, we ‘contextualized’ the notion of trust within W-MIE, focusing in the domain of information in sensitive context. For the purpose of this research, we look at the context of web based information for Islamic content sharing sites. These websites highlight information, knowledge and services, be it commercial or entertainment in nature reflecting Islamic ideologies, content, norms or values. The Internet play an invaluable role in breaking down the geographical boundaries enabling Muslims across the “ummah” (brotherhood) to exchange ideas, network and discuss their various views and positions on different aspects of Islam by storing and providing information about various Islamic organizations, places of worships, academic institutions, community events, entertainment, e-commerce activities, services and so on (Bunt, 2000; Shan., 1999). Many Muslims have joined the Internet bandwagon in extolling its merits as a primary source of information through the increase amount of Islamic sites on the Internet, where some of which devoted to Islamic education and dissemination e.g. Al-Islam (al-islam.org), information on consumer product and services (e.g. ifanca.org) while others more commercial and entertainment in nature. It also becomes a powerful tool for da’wah (Islamic propagation), conveying the message of Islam and making connection with their faith through the Internet to the others (Bunt, 2000).
In this respect, a number of conferences and seminars begin to address the "Islamicity" of IT as well as how Muslims can use IT to further using the Internet to present and acquire knowledge on Islam, sharing information among Muslims around the world as well as establishing personal, business and organizational connections (IKIM, 2000). However, due to the anonymous nature of such technology, the reliability and authenticity of information received by those seekers of Islamic knowledge can be problematic. To some extend, it's hard to make distinction between information (about Islam) and true knowledge (Khan and Khan, 1999) with some of the inauthentic Islamic sites that disseminate and communicate information pertaining to Islam. Hence, researchers argue that there is a need to monitor information on Islam so that fabricated and misleading information can be easily identified (Khan and Khan, 1999). Some have recommended in developing a mechanism of certification and authentication for Islamic sites disseminating information on Islam or obtaining approval from well known Islamic organizations, in a similar manner that halal certification is required for food products (Shan, 1999; Khan and Khan, 1999).

This gives way to our initial assumptions on how to design an information artifact that is perceived trustworthy; which can be understood, rationalized and control as part of the overall interface design strategy. The focus of this thesis is to reveal in greater depth on the understanding of trust within W-MIE that takes into account of trust determinants from the perspective of human actor's reasoning in the context where the sense of a community with common norms and values are significant. We believe the solutions would be to understand the trust operationalization in a holistic manner by taking the assumption of human forces, focusing on those parts of the systems directly experienced and understood by the ordinary people. If trust forms the basis of successful 'off-line' human interaction then it must also form the basis of our on-line interaction. A website is merely an extension of human interaction and therefore there is a need in the ability to transfer human trust reasoning mechanisms into the design of the web interface. The role of system designers and researchers not one of solely increasing the functionality and usability of the systems that are used to transact or communicate, but to design them in
such a way that they support trustworthy action and based on cultural understanding. Designers must be aware of their role as social engineers when creating online environments as the design of these systems will shape how people behaved and it will impact the level of trust and trustworthy behavior of the users.

1.2.2 Research assumptions

The research on trust issues in the e-mediated environment has been the subject of previous investigation of tangible trust perspectives in relation to e-tailing context. In the IS research, the studies of trust formation as an emotional, 'intangible’ response to computer based stimuli (Corritore et. al., 2003; Egger, 2000; French et. al., 2007) or known as the ‘non technical mechanism’ of trust perspectives (Riegelsberger et. al., 2005) or ‘soft trust dimension’ (Kräuter et. al., 2006) is an equally diverse field as the tangible trust.

This thesis puts at the centre of its projection of trust research not as purely governed by technical mechanisms but as a technology which mediates already established and long practices routine of human behavior. This thesis looks into on how human reasoning trust online triggered by the perceived trustworthy elements of an interface apparent to the users. As more people go online for seeking information regardless of context it becomes increasingly important to identify what makes people choose to trust some sites and reject others. In this sense, while not disregarding the importance of online security and the evolving systems that support it, we believe that security has little to do with general consumer trust. This is the case not only because of consumers lack of expertise needed to make informed choices but more importantly because of their general lack of interest in the technology of security (Karvonen, 2000). This leads to the assumptions that current trust research in IS are hampered by designing for computers rather than humans. The initial spontaneous approach of engineers and computer scientists to those trust issues was that of increasing security by security protocols, authentication, cryptography, central control, rigid rules etc. Although some of these measures are