Development of a Framework for Trust in Mobile Commerce

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ABSTRACT

Mobile commerce represents a significant development in e-commerce. Despite the potential of mobile commerce, trust is a major obstacle in its adoption and development. The focus of this research is to develop a framework to identify the factors influencing trust in mobile commerce and to explain the development of such trust using a means-ends objective network. We utilized the Value-Focused Thinking approach to interview subjects in order to identify their fundamental and means objectives concerning trust in mobile commerce and to construct a means-ends objective network. A trust framework is developed from the means-ends objective network. As one of the first research on trust in mobile commerce, the framework developed in this study provides valuable information for researchers and practitioners, and serves as a conceptual foundation for future research in mobile commerce.

Keywords

Trust, mobile commerce, value-focused thinking.

INTRODUCTION

Advances in wireless technology have stimulated rapid developments in electronic commerce (e-commerce) via the use of mobile devices. E-commerce transactions conducted through radio-based wireless devices are called mobile commerce (also known as m-commerce or mobile e-commerce). Mobile commerce can extend current Internet sales channels into more immediate and personalized mobile environment. However, one of the most daunting challenges to ensure wide diffusion of mobile commerce concerns trust in mobile commerce. Lack of consumer trust is the most significant long-term barrier for e-commerce (Keen, 1997), as well as for mobile commerce. Although mobile devices are more convenient for "anytime shopping", it has some unique features and characteristics that hinder the development of consumer trust.

To become a viable means of doing business, mobile commerce must overcome the problem of user distrust. An in-depth understanding of the factors that constitute and can bring about consumer trust in mobile commerce is essential.

LITERATURE REVIEW

Trust plays a crucial role in commercial relationships (Nah and Davis, 2002). Trust has been studied in various disciplines ranging from social psychology to decision making. Recently, trust has been studied extensively in the e-commerce context (e.g., Jarvenpaa *et al.*, 1999; McKnight *et al.*, 2002a, 2002b; Shankar *et al.*, 2002; Lee and Turban, 2001).

Table 1 provides a summary of frameworks and models regarding trust in e-commerce and m-commerce.

BUILDING A MEANS-ENDS OBJECTIVE NETWORK USING VALUE-FOCUSED THINKING APPROACH

To understand the values leading to trust in mobile commerce, we used the Keeney's (1992) Value-Focused Thinking (VFT) approach to help identify these values. Value refers to the principles for evaluating the desirability of possible alternatives or consequences. Values that are of concern are made explicit by the identification of objectives (Keeney, 1992), where an objective is defined as a statement of something that one desires to achieve. There are two types of objectives: fundamental objectives and means objectives. Fundamental objectives are concerned with the ends that decision makers value in a specific decision context whereas means objectives are methods to achieve the ends.

The process of Value-Focused Thinking involves four steps (Keeney, 1992), as presented in Figure 1.
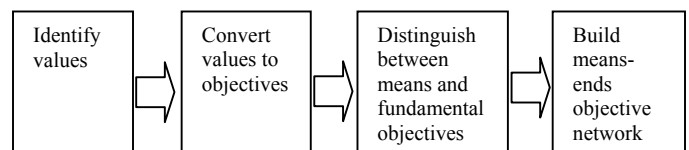

Figure 1: Procedures of Value-Focused Thinking

After interviewing subjects using the value-focused thinking approach, we derived the means and fundamental objectives, and then organized them into a means-ends objective network (see Figure 2).

Literature	Findings
Ambrose and Johnson (1998)	• Seller characteristics (ability, benevolence, integrity) • Buyer's propensity to trust
Ba, Whinston and Zhang (1999)	• Information asymmetry influences consumers' knowledge of product quality • Trusted third party (i.e., certification authorities) help to build trust
Belanger, Hiller and Smith (2002)	• Third party privacy seals • Privacy statement • Third party security seals • Security features
Cheung and Lee (2000)	• Trustworthiness of Internet vendor (perceived security control, perceived privacy control, perceived competence, perceived integrity) • External environment (third party recognition, legal framework) • Propensity to trust
Friedman, Kahn and Howe (2000)	• Reliability and security of technology • Anonymity of transaction information • Performance history and reputation of website
Fung and Lee (1999)	• Company reputation • Web-site interface • Information quality
Gefen (2000)	• Familiarity (with e-commerce vendor) • Disposition to trust
Gefen, Karahanna and Straub (2003)	• Calculative-based • Institution-based structural assurance • Institution-based situational normality • Knowledge-based familiarity • Perceived ease of use
Jarvenpaa *et al.* (1999)	• Perceived size • Perceived reputation
Kim and Prabhakar (2000)	• Trustor's propensity-to-trust • Word-of-mouth referrals • Institutional characteristics

Literature	Findings
Lee and Turban (2001)	• Trustworthiness of Internet merchant (ability, integrity, benevolence) • Trustworthiness of Internet shopping medium (technical competence, reliability, medium understanding) • Contextual factors (effectiveness of third party certification, effectiveness of security infrastructure) • Individual trust propensity • Other factors
McKnight, Choudhury and Kacmar (2002a)	• Perceived vendor reputation • Perceived site quality • Structural assurance of the web
McKnight, Choudhury and Kacmar (2002b)	• Disposition to trust (faith in humanity, trusting stance) • Institution-based trust (situational normality: general, competence, integrity and benevolence, structural assurance) • Trusting beliefs (competence beliefs, benevolence beliefs, and integrity beliefs) • Trusting intentions (willingness to depend, subjective probability of depending)
Nah and Davis (2002)	• Content of website • Design of website • External certifications and references
Pavlou and Ba (2000)	• Seller's reputation • Appropriate feedback mechanisms
Shankar, Urban and Sultan (2002)	• Website characteristics (e.g., navigation and user friendliness, advice, error free) • User characteristics (e.g., Internet savvy, past Internet shopping behavior, feeling of control) • Other characteristics (e.g., online medium, trustworthiness of firm, perceived size of firm)
Siau and Shen (2003)	• Trust in mobile commerce can be differentiated into two categories: trust in mobile technology and trust in mobile vendors.

Table 1: Summary of Trust Frameworks and Models

CONSTRUCTING THE FRAMEWORK ON TRUST IN MOBILE COMMERCE

The objectives we have obtained from interviewing mobile commerce users provide a comprehensive list of antecedents of trust in mobile commerce. In addition, the links between objectives depicted in the means-ends objective network suggest the causal relationships between the means and fundamental objectives. We classified the various objectives in the means-ends objective network into categories, and proposed a conceptual framework that outlines the variables influencing trust building in mobile commerce. This framework is shown in Figure 3.
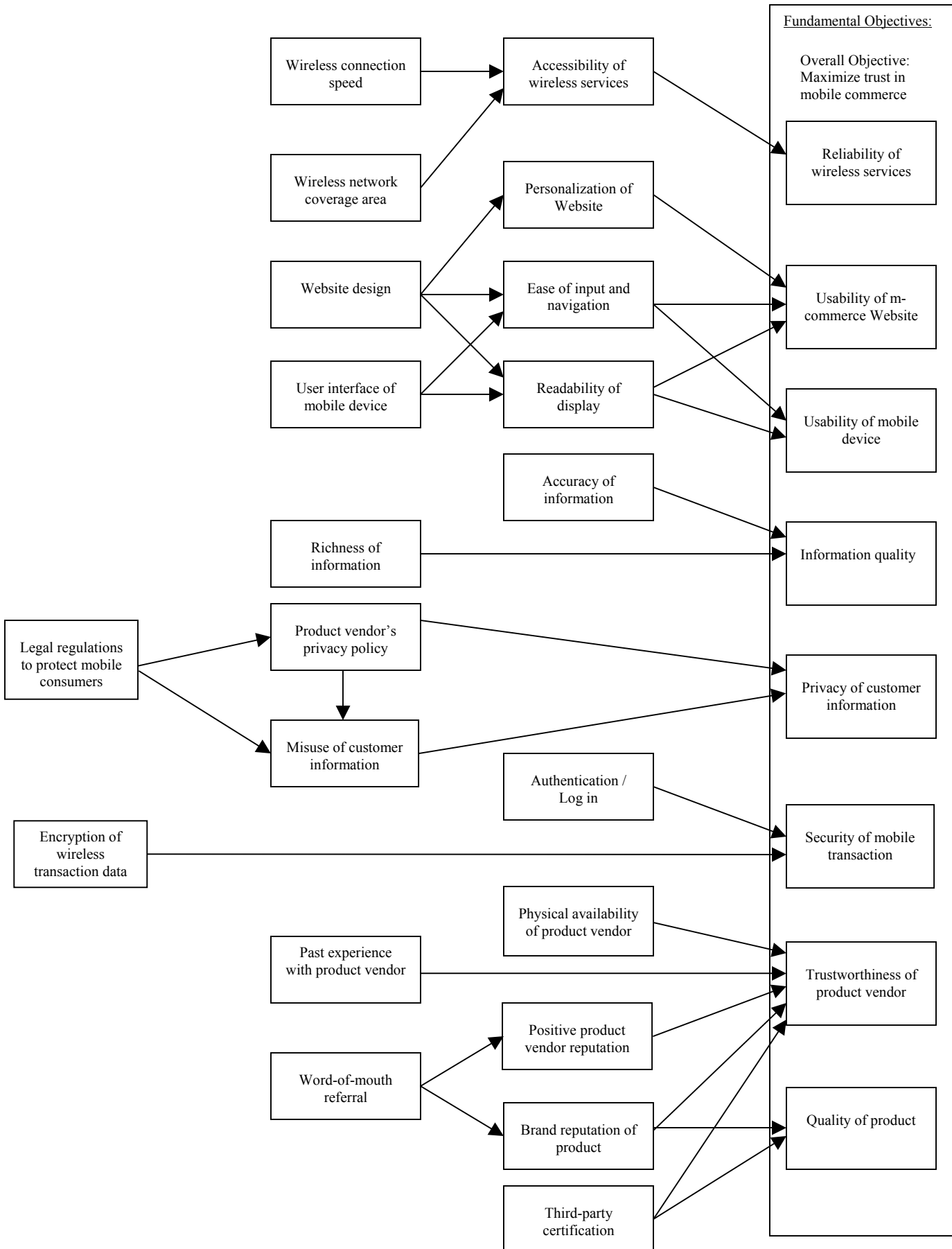
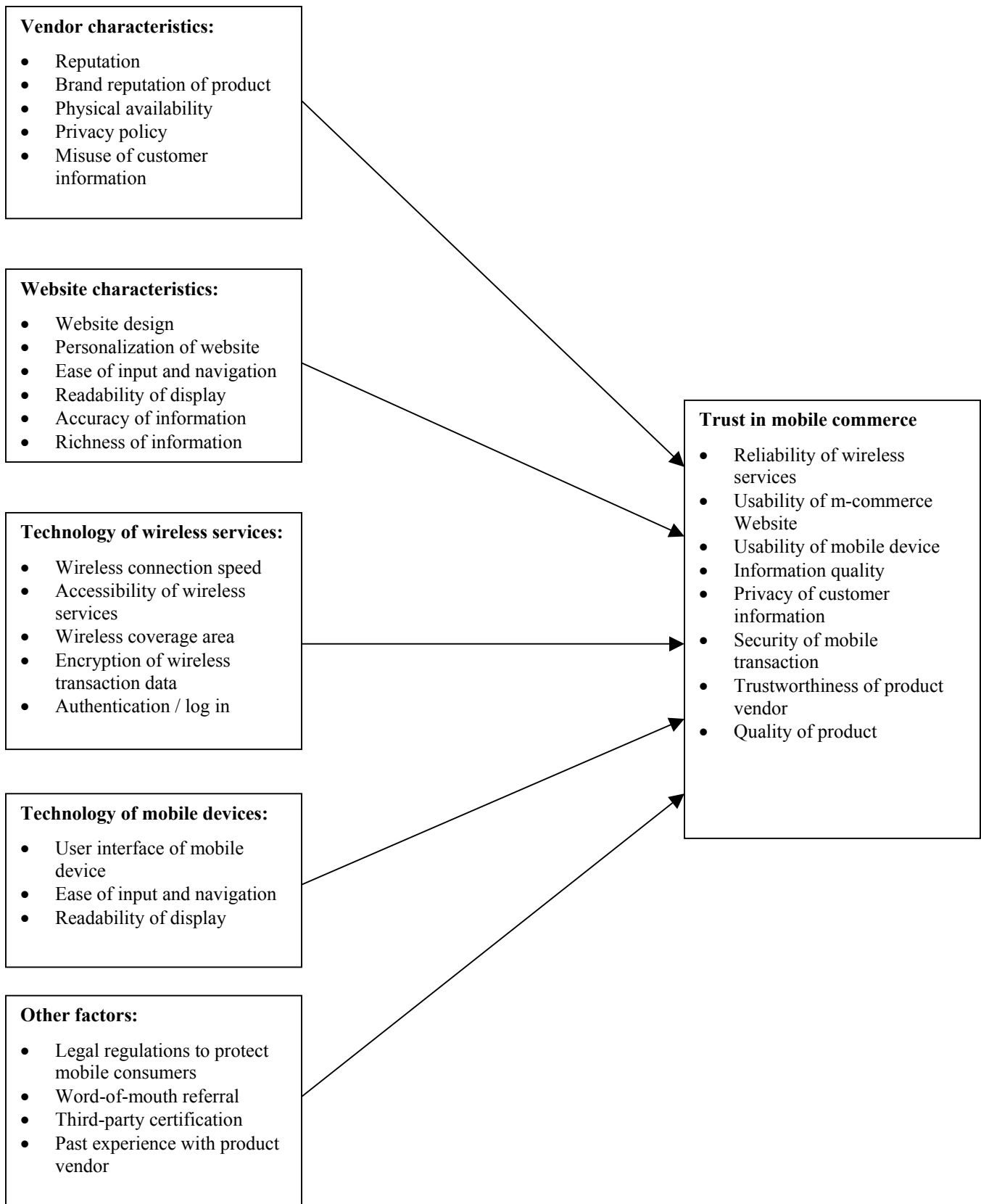**Figure 2: Means-Ends Objective Network**

Vendor characteristics:

- Reputation
- Brand reputation of product
- Physical availability
- Privacy policy
- Misuse of customer information

Website characteristics:

- Website design
- Personalization of website
- Ease of input and navigation
- Readability of display
- Accuracy of information
- Richness of information

Technology of wireless services:

- Wireless connection speed
- Accessibility of wireless services
- Wireless coverage area
- Encryption of wireless transaction data
- Authentication / log in

Technology of mobile devices:

- User interface of mobile device
- Ease of input and navigation
- Readability of display

Other factors:

- Legal regulations to protect mobile consumers
- Word-of-mouth referral
- Third-party certification
- Past experience with product vendor

Trust in mobile commerce

- Reliability of wireless services
- Usability of m-commerce Website
- Usability of mobile device
- Information quality
- Privacy of customer information
- Security of mobile transaction
- Trustworthiness of product vendor
- Quality of product

Figure 3: Proposed Framework for Trust in Mobile Commerce

DISCUSSION AND CONCLUSION

This study uses the Value-Focused Thinking approach to identify factors influencing trust in mobile commerce and presents a means-ends objective network to depict the relationships among those factors. Based on the means-ends objective network, a framework for trust in mobile commerce is developed.

This framework validates antecedents of trust in e-commerce in a somewhat different context – the mobile commerce context. Although some of the trust factors identified in this study have been presented in the e-commerce literature, our framework identifies new antecedents that are unique to trust in mobile commerce. For example, technology related factors are considered particularly important in mobile commerce due to the immaturity of mobile technology and the unique user-interface of mobile devices. As suggested by the subjects we interviewed, technology is a main barrier of trust in the conduct of mobile commerce. In our framework, there are three categories of technology related factors: technology relating to wireless services, wireless websites, and mobile devices. Some of the antecedents of trust in mobile commerce arise because of the unique interface and the limited features and functions of mobile devices. Other factors highlighted during the interviews include security features in the conduct of mobile commerce.

In conclusion, we believe that mobile commerce has tremendous potential. However, to achieve this potential, the trust issue needs to be more fully understood and directly addressed by vendors and providers of mobile commerce technologies and services. The framework of trust in mobile commerce developed in this research is an important step in this direction.

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