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# Customization and Customer Satisfaction for Mobile Commerce

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## ABSTRACT

This paper explores the impact of customization on customer satisfaction for mobile commerce. Customer satisfaction is one of the essential goals of CRM. Prior research has identified various determinants of customer satisfaction. Customization contributes to customer satisfaction by shaping customers' perception of the quality of products and services. In the context of mobile commerce, many technological constraints, such as small screen displays and limited bandwidth, tend to impede user adoption of mobile commerce. It therefore becomes crucial to customize interfaces, content, commerce transactions, and communication to meet mobile users' needs. This paper proposes a research model that expands on the expectation and desire disconfirmation model by incorporating constructs of perceived customizability and self-efficacy. Specifically, the proposed research model postulates that perceived customizability is influenced by a customer's self-efficacy for customizing wireless applications. As a result, perceived customizability may lead to positive perceptions of service performance, expectation and desire disconfirmation, and satisfaction.

## Keywords

Customization, satisfaction, mobile commerce, customer relationship management, perceived customizability, self-efficacy, expectation and desire disconfirmation model.

## INTRODUCTION

According to Winer (2001) and Dibb (2001), a company's best customers are their existing customers. Retaining existing customers has proven to be more cost effective than acquiring new customers. Based on current research, businesses are using mobile customer relationship management (mCRM) along with electronic customer relationship management (eCRM) to enhance customer satisfaction and improve customer relationship for retention purposes. The presence of CRM features on e-commerce Web sites (eCRM) has a direct and indirect impact on customer satisfaction (Feinberg and Kadam, 2002).

The convergence of mobile Internet and wireless communication technology has promised customers anytime, anywhere access to wireless services and communication. A wide range of wireless applications has been introduced as part of mCRM strategies. However, many constraints inherent in wireless handheld devices and mobile technology, such as small screen display and limited bandwidth, hinder efficient information access and transaction processes.

In this paper, we examine the role of customization in mCRM in terms of customer satisfaction. Customer satisfaction has been studied extensively in marketing and CRM-related research. Current research typically concentrates on physical product and service delivery. Only a few studies have focused on customer satisfaction with Internet-based services (e.g., Khalifa and Liu, 2001, 2002). Furthermore, to the best of our knowledge, no previous research has addressed customization and satisfaction in the mobile context.

We propose a research model that expands on the expectation and desire disconfirmation model (Khalifa and Liu, 2001, 2002) by incorporating constructs of perceived customizability and self-efficacy for mobile commerce. Twelve hypotheses stemming from the research model are proposed for future validation. This paper is organized in four sections: (1) a review of background literature on satisfaction, customization, and mobile commerce issues; (2) discussion of a new construct of perceived customizability and its antecedent; (3) the proposed research model and hypotheses; (4) conclusion and next steps for model validation. By presenting an expanded research model, this paper contributes to theory building for examining the role of customization in customer satisfaction for mCRM.

## BACKGROUND LITERATURE

### Mobile Services

Mobile commerce can be viewed as an extension of e-commerce for a site's existing customers (Chan et al., 2002; Chan & Fang, 2003). Delivering Web content and services to wireless handheld device presents many benefits to mobile customers. By embedding lightweight Web browsers into wireless handheld devices, the mobile web enables users to perform many time critical tasks such as checking stock quotes and booking flight anytime and anywhere. Ankar and D'Incau (2002) categorize mobile benefits in two groups: wireless values and mobile values. Wireless values refer to the use of wireless technology, such as PDAs or cell phones. Mobile values arise from the mobile use of technology in meeting users' time-critical needs and arrangements; spontaneous needs and decisions; entertainment needs; efficiency needs; and mobility related needs. The presence of mobile values makes the mobile channel a prominent means for commerce and information tasks.

However, wireless handheld devices have many inherent constraints in offering access to mobile applications. According to Zhou and Chan (2003), the common constraints in mobile computing are form factors, quality of network service, mobility, and personalization. Form factor constraints include small screen for content display, difficult and slow data input, scarcity of CPU power and memory, and incompatibility among diverse mobile browsers. The quality of network service is hampered by unreliable network connectivity and limited bandwidth of transmission. Mobility problems are caused by unreachable networks or the inability to obtain connections while moving into areas without adequate signal coverage. This is particularly a problem with transactional applications in m-commerce. In regards to the above constraints, researchers have emphasized the need for identifying usability guidelines for small screen interface design (e.g., Chan et al., 2002; Chan and Fang, 2003) and the use of personalization since data and content are delivered to highly personal devices (Anderson et al., 2001; Lanhorst et al. 2002). However, most of the content adaptation research for mobile services stem from technology perspectives. Few have focused on user-controlled content and interface adaptation for mobile applications.

### Customization

Customization is essential to both eCRM and mCRM strategies (Chan and Lam, 2004). Customization creates the perception that a company is interested in customer needs by offering increased choices (Shostak, 1987). Furthermore, customization can signal high quality of services and products and lead to a better match between the customer and the product (Ostrom and Iacobucci, 1995). Feinberg and Kadam (2002) have identified customization as one of the 42 eCRM features that affect customer satisfaction with retail Web sites. When a site is customized, individuals are able to complete their transactions more efficiently. A wide product selection may irritate customers and drive them to use simpler decision rules to narrow down the alternatives (Kahn, 1998). Therefore, it is important to understand the adaptation of e-service and its impact on customer behaviors and expectations (Rust and Lemon, 2001).

E-commerce and mobile commerce are two channels for providing information about products and brands, and for enabling sales transactions to enhance electronic markets. A wide range of wireless applications have been introduced as part of mCRM strategies. User-centered design for wireless applications (Chan et al., 2002; Chan and Fang, 2003) and personalized content adaptation (Zhang, 2003; Zhou and Chan, 2003) may minimize the constraints limiting handheld devices and contribute to the more effective use of the mobile Web for customer relationship building. Unique mobile features have been implemented mostly by content adaptation so that mobile users can access essential services and information more efficiently on their handheld devices. The concept of customization could therefore be applied to content display, interface presentation, navigation, links and shortcut, and loyalty programs for mobile application delivery on handhelds.

### Customization and Personalization

However, in current literature, customization and personalization have been used interchangeably without a clear definition (Fan and Poole, 2003). For our research model, a clear definition is necessary to differentiate customization from personalization. The Personalization Consortium (2003) defines personalization as the combined use of technology and customer information to tailor e-commerce interactions between a business and its individual customers. Machine-learning algorithms are integrated into systems to accommodate individual users' unique patterns of interactions with the system (Hirsh et al., 2000). Bunt et al (2004) define personalization as an *adaptive interface* that performs the adaptation for the user by modeling individual users' interests, preferences, and usage characteristics. Personalization therefore does not require a user's explicit preferences; it uses data mining techniques and algorithms to discover patterns of user behavior.

Conversely, customization allows Web site users to explicitly specify their own preferences, and tailor products and services according to these preferences. In other words, customization emphasizes user-initiated control. According to Bunt et al (2004), customization is the *adaptable interface* that allows users to customize the application to suit their needs. Zo (2003)

proposes that customization is a more effective approach than personalization for customer satisfaction because the former approach provides customers with a greater sense of control.

Zhou and Chan (2003) note that wireless handheld devices may target individual customers' needs because these devices are well suited for personalization and customization. Web mining techniques may be applied to the mobile Web to capture the mobile user's profile and browsing patterns. One common way to deliver customization is obtaining a user's profile and preferences by requiring the user to register online and fill out questionnaires prior to the usage of the system on the handheld. User sign-in or detection is required to identify the user. A system can then provide recommendations or personalized content. This method relies heavily on human input.

### **Customer Satisfaction**

Customer satisfaction is one of the major factors contributing to a long-term relationship between a firm and its customers. According to Keith (1960), customer satisfaction means satisfying the needs and desires of the customer. The theory of confirmation/disconfirmation of expectation has been widely adopted to explain customer satisfaction (Oliver, 1988). This theory suggests that satisfaction is the gap between expectation and perceived performance. A customer is more likely to be satisfied if the service performance meets (confirmation) or exceeds (positive disconfirmation) his or her expectations. A customer is more likely to be dissatisfied if service performance falls below his or her expectations (negative disconfirmation). Tse et al (1988) identify perceived actual service performance as a dominant determinant of satisfaction. If perceived service performance turns out to be below positive expectations, it may still negatively affect satisfaction and may override the impact of confirmation or positive disconfirmation, resulting in dissatisfaction.

Recent studies by Khalifa and Liu (2001, 2002, 2003) reveal that both expectations and desires play important role in explaining satisfaction. The formation of desires is not based on realistic predictions of actual performance, but rather on emotional needs or wants that are not necessarily constrained by a rational understanding of the situation. An individual may want a certain service to be good, but nevertheless may expect service to be poor based on his or her past experience and understanding of the actual environment. The desire disconfirmation model (Khalifa and Liu, 2002) argues that low performance may meet an individual's expectations, yet still fall below the desired performance (negative desire disconfirmation), and is more likely to lead to dissatisfaction. Therefore, satisfaction is being formed by the size of the gap between post hoc perceptions of Internet-based services and prior standards in terms of expectations and desires.

## **PERCEIVED CUSTOMIZABILITY AND ITS ANTECEDENT**

### **The Construct of Perceived Customizability**

The focus of our research is on customization in the mobile context. We propose a new construct of perceived customizability to address the issue of customization from a customer's perspective. This construct can be defined as "customer perception of the extent that he or she can customize and control the features of an online or wireless service or site." The emphasis of customizability is on customer-initiated actions. The dimension for customizability may include options for products, services, interfaces, content, communication methods, transaction process, and form factors. Zo (2003) postulates that if customers have more control over the processes of online services, they may feel the services as more reliable and secure. Such positive effects can lead to customer satisfaction and intention to return. Research by Johansson et al (2001) reveals that satisfaction is positively correlated to the user's perceived level of control. The study conducted by Bunt et al (2004) on adaptable (user-initiated) and adaptive (application-initiated) interfaces show that most participants in their study preferred the control offered by the adaptable interface and made extensive use of the customization facilities. Offering customization options upfront improved the user experience, particularly for experienced users. Novice users were more likely to take advantage of adaptable interfaces in later interactions with the site.

### **Dimensions of Customization**

Perceived customizability refers to a broad range of customizable features along the customer life cycle in three phases: acquisition, sales and services, and retention (Chan and Lam, 2004). Some customization features may be more important than others to satisfaction during different phases of the life cycle.

#### **Acquisition phase:**

- Customized content with preferred topics (relevant and accurate information);
- Customized priority of hyperlinks (well organized hyperlinks according to preferences);
- Customized search functions (advance preferences of search criteria and a display of results sorted by preference);

- Customized navigation (clickable icons vs. line item links, scroll bar vs. multiple pages of sorted content display); and
- Customized interface (intensive graphics or text base, desirable pictures).

Sales and Services phase:

- Customized products, services, and build-to-order products; and
- Saving customer personal data to customized purchase transactions, such as one-click checkout.

Retention phase:

- Customized loyalty programs;
- Customized summary reports for reward status and preferable qualify rewards; and
- Customized delivery reports and email notifications per customer's preferences or requests.

Therefore, dimensions of customization may comprise user-initiated control of features across three phases of customer life cycle. In the mobile context, customization may also comprise features that address technological constraints:

- Customized menu hierarchy;
- Customized navigation;
- Customized input methods;
- Choices of form factors;
- Customized modality for input and output (such as aural versus visual); and
- Customized communication options.

### **Self-Efficacy as an Antecedent**

Since many technological constraints may hamper customer adoption of mobile services, it is important to address the antecedent of perceived customizability. Unfamiliarity with handheld devices and mobile services may affect a customer's self-efficacy in taking advantage of customization facilities offered by mobile services. Bandura (1986) defines self-efficacy as a person's judgment of their capability to organize and execute courses of action required to attain designated types of performances. Self-efficacy is concerned not with the skills one has but rather with judgments of what one can do with whatever skills one possesses. In other words, in the technology field, self-efficacy represents an individual's perceptions of his or her ability to use the technology in accomplishing a task rather than reflecting simple component skills. According to Compeau et al. (1995), the magnitude of self-efficacy refers to the level of task difficulty that one believes is attainable. Individuals with a high magnitude of self-efficacy will see themselves as able to accomplish difficult tasks, while those with a low self-efficacy magnitude will see themselves as only able to execute a simple form of the behavior. Dishaw et al (2002) further define self-efficacy as a person's belief in his or her ability to accomplish a special task within the context of task-technology fit.

Self-efficacy strength refers to a person's level of conviction about his or her judgment. It reflects the resistance of self-efficacy to apparently disconfirming information (Brief and Aldag, 1981). The magnitude of self-efficacy magnitude may be gauged in terms of the support levels required to undertake a task. Individuals with a high magnitude of self-efficacy might judge themselves to be capable of operating with less support and assistance than those with a lower judgment of self-efficacy magnitude. Self-efficacy is determined by encouragement of usage, usage by others, and the level of support (Compeau et al., 1995). A higher level of self-efficacy increases one's liking and usage of the technology and lowers his or her anxiety about the technology. Compeau et al (1999) have proved that higher self-efficacy yielded high performance-related outcome expectations and personal outcome expectations.

Both Bandura (1986) as well as Dishaw et al (2002) believe that self-efficacy is determined by past experience. It has a direct impact on perceived ease of use, perceived usefulness, and task technology fit. This argument is significantly correlated with the TAM/TTF model. Hwang and Yi (2002) agreed with Dishaw et al that self-efficacy has an impact on perceived ease of use. The latter group of researchers has also proved that self-efficacy has a positive impact on the actual use of technology.

### **MODEL DEVELOPMENT**

Our research model expands on Khalifa and Liu's (2002) expectation and desire disconfirmation model by incorporating the constructs of perceived customizability and self-efficacy, as shown in Figure 1. We believe that Khalifa and Liu's model for electronic services is relevant to mobile services. At the current stage of mobile commerce, technological constraints and limited mobile services may make customers to hold desires and expectations about mobile services. Therefore, their desires

and expectations may form different comparison standards for perceived service performance and customer satisfaction. We also believe that user-initiated customization of content, products, transaction processes, and interfaces can significantly improve the experience and satisfaction of mobile customers. Their perception of the level of customizability of a mobile service may be affected by their self-efficacy. Therefore, our research model proposes that four constructs, “expectation disconfirmation,” “desire disconfirmation,” “perceived performance,” and “perceived customizability,” are the main determinants of customer satisfaction in the context of mobile commerce. The structured model as illustrated in Figure 1 comprises of our twelve hypotheses.

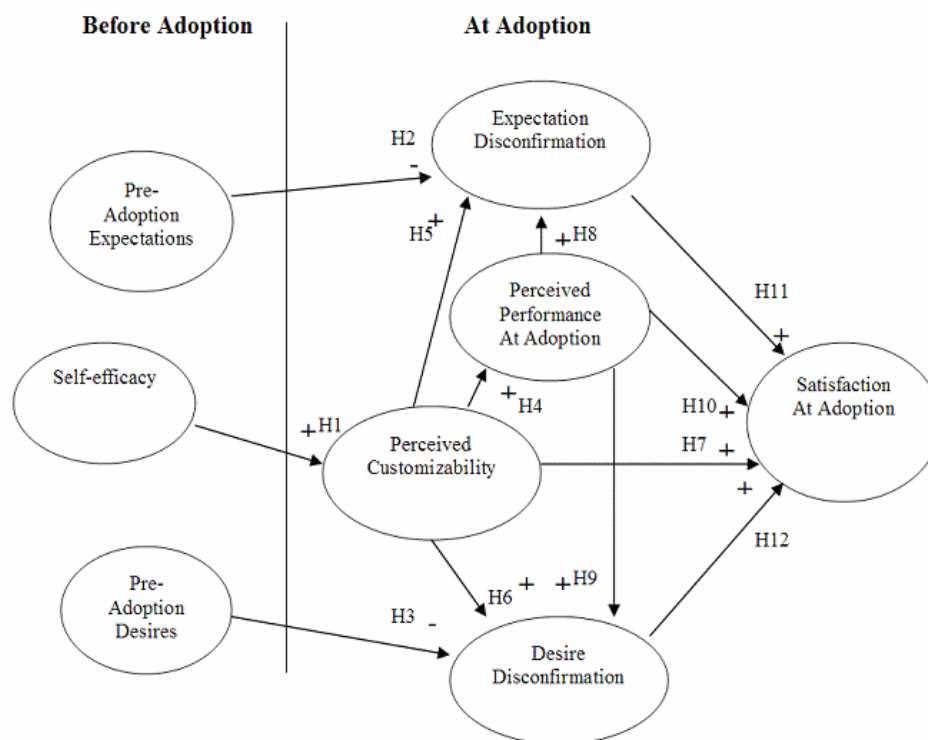


Figure 1. The research model.

Based on the earlier discussion about the relationship between self-efficacy and perceived customizability, we postulate a positive relationship between these two constructs. Self-efficacy is the antecedent of perceived customizability. The higher the customer's self-efficacy of his or her ability to customize products, content, transaction processes, communication methods, and interface for a mobile service, the more positive is his or her judgment on using customization facilities, and thus results in positive perceived customizability. Therefore, we postulate that:

*H1: Self-efficacy of using customization facilities will have a positive effect on perceived customizability of a mobile service.*

Hypotheses two and three are drawn directly from the findings of Khalifa and Liu (2002). Both customer desires and expectations are used as comparison standards in the disconfirmation process, and are subsequently compared to perceived performance at adoption. When the level of pre-adoption expectations or desires is high, these comparison standards are less likely to be reached by the perceived performance of a mobile service. Therefore, the higher the pre-adoption expectations or desires, the more negative the disconfirmation (Khalifa and Liu, 2002).

*H2: Pre-adoption expectations have a negative effect on expectation disconfirmation at adoption of a mobile service.*

*H3: Pre-adoption desires have a negative effect on desire disconfirmation at adoption of a mobile service.*

Perceived customizability is customer perception of the extent to which he or she can customize and control the features of an online or mobile service based on the customer's own preferences. A high level of perceived customizability can make a mobile site easier to navigate and make it more efficient to download tailored content. Customization can also give customers a sense of reliable processes and secure transactions by offering less complex transaction processes, preferred communication methods, and choices of relevant tasks. Overall, these customization features can lead to positive perceptions of a mobile service's performance.

*H4: The level of perceived customizability has a positive effect on perceived performance of a mobile service at adoption.*

The level of perceived customizability may also contribute to the customer's positive expectations and desire disconfirmation. When customers perceive that they have options to tailor the information displayed and how transactions are processed on their handheld devices, a mobile site's usability and usefulness may improve considerably. Consequently, customization features may help to reduce the gaps between expectations and service performance, as well as gaps between desires and service performance at the adoption stage. Therefore, we postulate the following:

*H5: Perceived customizability has a positive effect on expectation disconfirmation of a mobile service at adoption.*

*H6: Perceived customizability has a positive effect on desire disconfirmation of a mobile service at adoption.*

In addition, perceived customizability may have a direct, positive impact on customer satisfaction in regards to the adoption of mobile services. Johansson et al (2001) show that satisfaction is positively correlated to the user's perceived level of control. The work of Bunt et al (2004) supports that user-initiated adaptable interfaces result in more positive experiences and task performance. Therefore, we postulate that perceived customizability will be one of the determinants of customer satisfaction.

*H7: Perceived customizability has a positive effect on satisfaction of a mobile service at adoption.*

The remaining five hypotheses (H8 to H12) are derived directly from prior research studies (Khalifa and Liu, 2002, 2003). A high level of perceived service performance at adoption leads to positive expectation disconfirmation (H8) and desire disconfirmation (H9) because good service performance helps to match or exceed customer expectations and desires. Perceived service performance at adoption (H10), expectation disconfirmation (H11), and desire disconfirmation (H12) contribute directly to positive, overall customer satisfaction at adoption. Based on the result of previous studies (Khalifa and Liu, 2003; Spreng et al., 1996; Patterson et al. 1997), the effect of perceived performance on satisfaction is not fully mediated by expectations or desire disconfirmation. When desires or expectations are low, the role of perceived performance becomes more dominant in explaining customer satisfaction.

*H8: Perceived performance at adoption has a positive effect on expectation disconfirmation of a mobile service at adoption.*

*H9: Perceived performance at adoption has a positive effect on desire disconfirmation of a mobile service at adoption.*

*H10: Perceived performance at adoption has a positive effect on satisfaction with a mobile service at adoption.*

*H11: Expectation disconfirmation at adoption has a positive effect on satisfaction with a mobile service at adoption.*

*H12: Desire disconfirmation at adoption has a positive effect on satisfaction with at adoption.*

The results from Khalifa and Liu's (2002) desire disconfirmation model indicate that there is still room for other factor(s) to explain satisfaction. Our proposed research model suggests that the construct of perceived customizability may be an additional determinant for expectation disconfirmation, desire disconfirmation, and overall customer satisfaction at adoption.

## **EXPECTED CONTRIBUTIONS AND CURRENT STATUS**

This paper presents a structured model that defines relationships among perceived customizability, self-efficacy, expectation and desire disconfirmation, perceived service performance, and customer satisfaction. The conceptual model contributes to a better understanding of the role customization plays in customer satisfaction for mobile commerce. As customization becomes an increasingly important strategy for CRM, this research will help to expand the theory of customer satisfaction.

We will empirically test the proposed model in an experiment that will encompass a diverse set of mobile services. The experiment sites will incorporate various options for participants to customize content presentation, interfaces, product

choices, transaction processes, and communication methods. Participants will receive training on wireless handheld devices and the use of mobile web technology. Participants will be asked to perform various tasks with the availability of customization facilities. Items will be developed to measure perceived customizability. We will adopt or modify previously established items to measure other constructs in the research model. Data will be collected before adoption and immediately after participants complete a pre-defined set of mobile tasks.

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