

ENRICHING A SEAMLESS CUSTOMER EXPERIENCE IN ELECTRONIC CROSS-CHANNEL COMMERCE

Research-in-Progress

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Abstract

With the rapid emergence of newly developed mobile technologies, many retailers have launched mobile services (i.e., mobile site or application) for communicating with and delivering their products or services to customers. However, they still have a trouble to deliver a cohesive and seamless cross-channel experience to customers. To address this challenge, this study attempts to investigate how mobile applications deliver a seamless customer experience in electronic cross-channel commerce. This study proposes that, in the context of electronic cross-channel commerce, mobile application characteristics (functional configuration and interactivity of mobile application) have an impact on channel integration quality. Moreover, channel integration quality enriches overall satisfaction with the retailer, leveraging website quality. Contributions of this study include (1) theoretically, a suggested theoretical framework for effective mobile application design as an extension of website, and (2) practically, helping practitioners to articulate effective the Internet or mobile strategy in mobile-based or cross-channel online markets.

Keywords: Electronic cross-channel commerce, channel integration quality, mobile application, environmental psychology, brand extension theory

Introduction

The rise of mobile is transforming customers' interaction with the retailers, and simultaneously transforming the way that business is conducted and delivered. In such an environment, mobile device and its applications are recently regarded as a valuable channel for interacting with general public as well as online customers, just as websites to date have done (Neslin et al. 2006; Noble et al. 2009; Oracle 2011). Many businesses, as a result, have launched and utilized customized mobile services (e.g., mobile sites or applications) as a tool for communicating with and delivering products or services to the customers, along with their websites.

According to business research report (Oracle 2011), more than three-quarters of consumers use two or more channels to research and complete the transactions when they purchase a product or service. Particularly with the strong growth of mobile services, nearly a third of consumers are using their mobile devices to browse or research products and services (Oracle 2011). In vein with this, electronic cross-channel commerce can be defined as commerce for communicating with and delivering the products or services to customers through two or more online channels (i.e., website, mobile site, mobile application, etc.) in electronic commerce (e-commerce) environments (Sousa et al. 2006). To be successful in electronic cross-channel commerce, Oracle co., one of the biggest IT companies, suggests that "retailers need not necessarily serve up the identical experience in each channel, but rather they can optimize and connect channel interactions to deliver consistent user experiences" (Oracle 2011, p.4). Consequently, many retailers have tried to invest in the mobile service as a valuable channel for e-commerce, and plan their strategies to ensure that their sites including website, mobile site, or mobile application provide a integrative customer experience (Adobe 2010; Lamont 2012b).

However, many retailers still have a trouble to deliver a cohesive and seamless cross-channel experience to customers, even though today's innovative mobile devices are capable of delivering PC-like experiences (Fodor 2012; Gartner 2010; Nielsen et al. 2005; RIS 2011; West 2011). As a result, 57% of mobile web users would not recommend a business with a bad mobile site, and 40% of users have turned to a competitor's site after a bad mobile experience, according to a recent survey from Compuware (2011). A bad experience on a mobile site or application leaves consumers much less likely to return to, or recommend, a particular website. Therefore, in the context of electronic cross-channel commerce, there is a critical need to understand what characteristics of mobile service, particularly mobile applications, impact a customer's seamless experience and how mobile applications leveraging websites enhance customer satisfaction with retailers.

The purpose of this paper has two aspects. First, we propose that perceived quality of channel integration representing a customer's seamless experience impacts a customer's overall satisfaction with retailers, by leveraging website quality. Second, we propose that mobile application characteristics (e.g., functional configuration and interactivity of mobile applications) affect a customer's perceived quality of channel integration in electronic cross-channel commerce.

Next, as a Research-in-Progress, we describe literature review for this study. Then, we address our research model and hypotheses with theory development. In the section that follows we discuss our proposed empirical methodology, and then conclude with a brief discussion.

Literature Review

Electronic Cross-Channel Commerce

One of the most dramatic trends in the shopping environments has been the proliferation of channels through which customers can interact with firms, which is called cross-channel commerce (Neslin et al. 2006). Cross-channel commerce, which is often used interchangeably with multi-channel or omni-channel commerce (Fodor 2012; Noble et al. 2009), refers to commerce for communicating with and delivering the products or services to customers through two or more channels (e.g., physical store, catalog, website, mobile web, etc.) (Sousa et al. 2006). To gain more information about or to complete the purchase of a product or service, people often use diverse channels including computers, mobile devices, bricks-and-mortar stores, catalogs, and customer service representatives (Oracle 2011). These channels are not isolated from one another; rather, they overlap (Evans 2009). In line with this, cross-channel commerce context has received increasingly attention from academics over the past decade,

particularly shedding light on the effect of channel synergies and brand extension (Hahn et al. 2009; Kwon et al. 2009; Verhoef et al. 2007; Yang et al. forthcoming). Considerable evidence also suggests that retailers complementing their traditional channels with new channels (i.e., mobile site or mobile applications) would be more successful than single-channel retailers (Gulati et al. 2000; Sousa et al. 2006; Vishwanath et al. 2001).

With the rapid emergence of newly developed mobile technologies, mobile services can be recently regarded as a critical channel for e-commerce, by offering ‘anytime, anywhere’ touchpoints to consumers. Mobile services using mobile device and its applications provide people with values by connecting them to Internet services traditionally accessed on desktop or notebook computers, and by making it easier to use the Internet on their mobile devices. It also enables people to live more productive and enjoyable lives as they gain near-instant access to the information and services they desire (Gravitytank 2009). The ability to communicate at virtually any place and any time offers an unprecedented level of flexibility, accessibility, and convenience to customers with the convergence of the wired and wireless technologies (Adipat et al. 2011; Lamont 2012a). Thus, mobile service is an important facet of the cross-channel commerce, particularly within 18-to-34 age bracket (Oracle 2011). For example, 26 percent of all consumers and 40 percent of the 18-to-34 age group consumers use their mobile devices to browse or research products and services at least four times a year (Oracle 2011). Therefore, the scope of this study focuses on *electronic cross-channel commerce*, highlighting the interaction between wired (websites) and wireless (mobile applications) channels for supporting consumers’ e-commerce activities (e.g., transaction, purchasing, information search, online discussion, etc.) in online environments.

A Seamless Customer Experience in Mobile Applications

As cross-channel commerce is regarded as the most compelling opportunity in retail today, some retailers are trying to offer a unified cross-channel environment that keeps pace with consumer expectations for a faster, easier, more fluid shopping experience (Rigby 2011). It enables consumers to be efficiently shifting seamlessly between various touchpoints to shop, buy and fulfill orders according to their preferences. In the sense, prior studies asserted that retailers need to achieve cross-channel integration because the lack of a consistent experience across channels can jeopardize the customer-business relationships (Madaleno et al. 2007; Neslin et al. 2006; Sousa et al. 2006).

Although mobile applications, as an extension of website for a communication channel, are strongly linked with existing websites in commercial and business domains, the convenience of mobile service has been compromised by some challenges posed by the unique constraints of handheld devices (e.g., small screen size and limited memory), wireless networks, and the mobility of users (Adipat et al. 2011; Zhang 2007). Most existing websites are designed and optimized for desktop only, such that they are not suitable for mobile applications with unpleasantness aesthetics, low legibility, and small amount of information (Adipat et al. 2011). For example, while a mobile application might be simple to use, its corresponding website may be complicated and frustrating (Tate 2011). Therefore, customizing mobile applications with a smaller screen size or utilizing the right development technologies to support the mobility for mobile services leads mobile application developers to use different approaches to its design (Gualtieri 2011).

In the sense, designing mobile-friendly site leveraging website can be critical for improving customers’ integrative experience in electronic cross-channel commerce, because effectively designed mobile services may enable customers to keep in touch with the retailers, facilitates other business processes, and adds values in the era of quick communication (Adipat et al. 2011; Adobe 2010; GlobalLogic 2011; RIS 2011; RIS 2012; Tate 2011). Nonetheless, it may be extremely difficult to achieve and thus holds great potential for generating competitive advantage and delighting the customer (Sousa et al. 2006). Therefore, this study aims to provide the understanding of how mobile applications leveraging websites enrich customer satisfaction with a seamless experience in electronic cross-channel commerce.

Theoretical Development

To emphasize the importance of a seamless customer experience in electronic cross-channel commerce, we draw on two theoretical perspectives: environmental psychology and brand extension theory. In specific, these two perspectives provide a theoretical base of why the provision of a seamless and consistent experience (i.e., channel integration) is important in cross-channel commerce.

An Environmental Psychology Perspective

Environmental psychology is a branch of psychology that is concerned with providing a systematic account of the relationship between person and environment (Kaplan et al. 1982; Parboteeah et al. 2009; Russell et al. 1982). From this perspective, human behavior is determined by the environment as a powerful and direct causal influence. The environment plays a critical role as more than an antecedent of human behavior, because it also affords opportunities for future action (Russell et al. 1982). According to the environmental psychology perspective, one way in which humans cope with processing information is through the use of cognitive maps. As an accumulation or summary of experiences, people's cognitive maps can be used to make their way through an environment (Rosen et al. 2004). Particularly, people are motivated to use and extend these maps through environments designed to take advantage of these cognitive maps (Kaplan et al. 1982). The stored information people have about an environment necessarily influences how they cognitively or affectively perceive the environment; in other words, it enables them to have larger experience of the environment (Kaplan et al. 1982). Prior environmental psychology research has posited that various environmental stimuli have an impact on developing people's cognitive maps (Chang et al. 2008; Eroglu et al. 2001; Kaplan et al. 1982; Mehrabian et al. 1974; Parboteeah et al. 2009). Kaplan and Kaplan (1982) also described that the experience people have of the environment is structured and shaped by the appropriate representation of environmental stimuli, by addressing that cognitive maps require people's evaluation in order to be effective guides to action. Thus, the cognitive maps facilitate people's decision-making and permit them to have feelings about environments that are not relatively familiar with.

In sum, environmental psychology explains how providing users with effective environments makes it easier for them to process information and function effectively (Rosen et al. 2004). Therefore, we have chosen to take an environmental psychology perspective as an overarching theory in the current study, in that this perspective provides a theoretical foundation elucidating that human functioning can be determined by effectively designed environments. In particular, environmental psychology represents that customers' cognitive maps which are formed by existing channels play a salient role in constructing their perception of new channels. Thus, environmental psychology can be appropriate theory base for explaining the importance of a seamless experience that customers perceive when they use a relatively new channel like mobile applications, by emphasizing the interaction between websites and mobile applications in electronic cross-channel commerce environment.

Brand Extension Theory

Brand extension refers to use of an established brand name to facilitate entering a different product class or market (Aaker et al. 1990). According to brand extension theory, specific brand information is stored in customer's memory, and then it can be retrieved when a variety of associations about a brand are linked. Particularly when a new product brand is considered to be consistent with the original known product brand image held in the memory, the underlying mechanism of brand extension may be triggered (Yang et al. forthcoming). With the widespread adoption of mobile devices in e-commerce environments, the concept of brand extension has been applied in an electronic cross-channel context (e.g., Kwon et al. 2009; Yang et al. forthcoming). Based on a brand extension theory, a number of studies have considered different channels (e.g., website and mobile application) as complementary, highlighting the effects of channel synergy on customer behaviors in e-commerce environments (Hahn et al. 2009; Kwon et al. 2009; Verhoef et al. 2007; Yang et al. forthcoming). In other words, when the existing image or reputation of the retailer's website can be well transferred to the mobile site or application, customers are more likely to have more favorable attitude to the retailer (Kim et al. 2005; Kwon et al. 2009; Yang et al. forthcoming). Therefore, with the underlying brand extension mechanism, firms may able to leverage this brand extension effect to offer a seamless and consistent experience to customers in cross-channels.

Channel Integration Quality

Customer experience is defined as a set of interactions between a customer and a product, a retailer, or any part of an organization, which provokes a reaction (Shaw et al. 2002; Sheng et al. 2012). Corresponding to the different moments of channels such as contacts or touchpoints, customers interact with a retailer and its offerings, and then they evaluate their experiences to the retailer by comparing their expectations with the stimuli provided by a retailer (Sheng et al. 2012).

To describe a seamless customer experience in electronic cross-channel commerce, we employ the concept of channel integration quality in this study. *Channel integration quality* refers to the extent to which customers perceive a seamless service experience across multiple channels (Sousa et al. 2006). According to Payne and Frow (2004), the incoherence or conflict between channels will confuse customers and make them to misinterpret the retailer's offering. As a result, it leads to potentially diminish the customer's view of the retailer. For example, if there is inconsistency of information between two different channels, this will clearly result in a negative perception of retailers' service quality (Festinger 1957; Sousa et al. 2006). Therefore, channel integration quality is a key factor for enriching a seamless customer experience in electronic cross-channel commerce, because customer experience is developed across all moments of touchpoints including websites and mobile applications (Madaleno et al. 2007; Sousa et al. 2006).

Research Model and Hypotheses Development

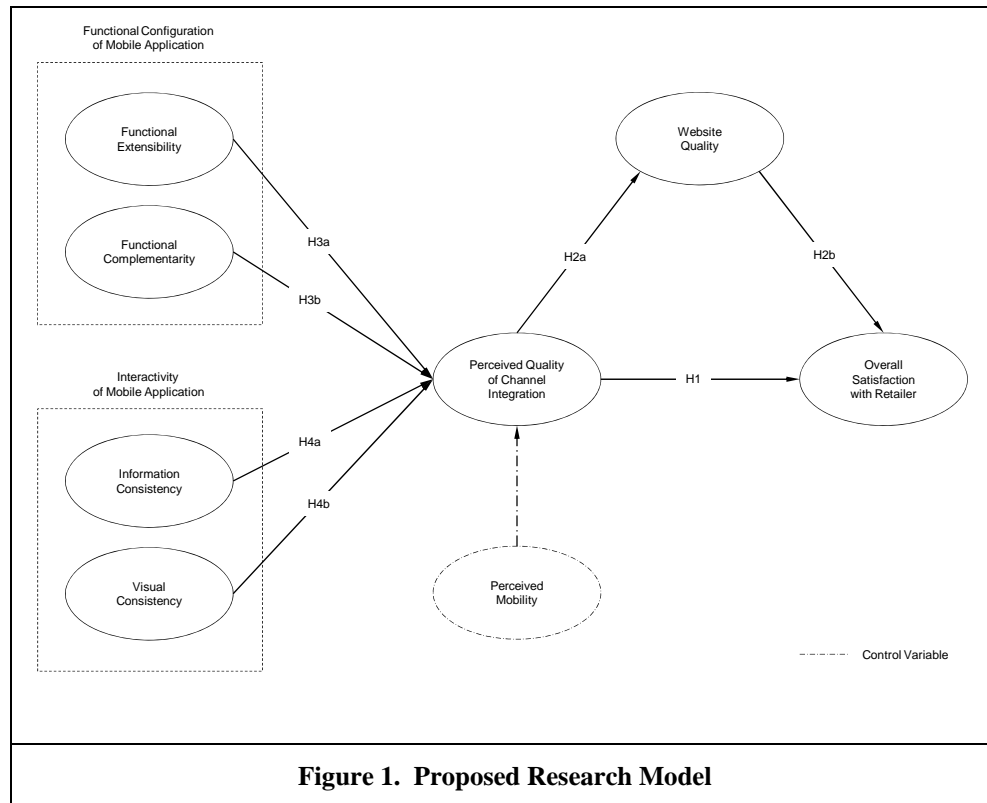


Figure 1 depicts our proposed research model, including the major theoretical constructs and their hypothesized relationships. Based on our theoretical perspectives, we first propose that a customer seamless experience, which is represented by customers' perceived quality of channel integration, can be determined by mobile application characteristics (functional configuration and interactivity of mobile application) in electronic cross-channel commerce. Second, we address that channel integration quality impacts overall satisfaction with retailer, leveraging website quality. Additionally in order to clearly show our research focus, we present perceived mobility as a control variable for perceived quality of channel integration.

Customer Satisfaction in Electronic Cross-Channel Commerce

Customer satisfaction paradigm can provide rich insights into the processes that affect a customer's post-usage cognitive evaluation of product or service (Oliver 1996). As a strong behavioral predictor, customer satisfaction is defined as the customers' evaluation and affective response to the overall product or service, or to the experience after they use a product or service. Hence, *customer satisfaction with retailer* is conceptualized as overall

satisfaction of the customer with the retailer based on their consumption experience with a product or service (Madaleno et al. 2007), regarding as a product of cross-channel integration quality and individual channel quality (e.g., website quality).

Offering a seamless and consistent experience across channels plays an essential role in enhancing the quality of the customer relationship (Madaleno et al. 2007; Payne et al. 2005). Moreover, well-integrated channels encourage desirable customer attitudes such as satisfaction and loyalty (Montoya-Weiss et al. 2003; Neslin et al. 2006). Thus, channel integration quality affects customer satisfaction in electronic cross-channel commerce.

H1. *In electronic cross-channel commerce, perceived quality of channel integration is positively associated with overall satisfaction with the retailer.*

Regarding website as a core component of e-commerce, many academic scholars have been forced to develop website evaluation instruments (Devaraj et al. 2002; Loiacono et al. 2007; Torkzadeh et al. 2002). As one of key e-commerce metrics, website quality includes various dimensions such as tailored information, trust, response time, ease of understanding, visual and emotional appeal, and so on (Loiacono et al. 2007). Similarly, DeLone and McLean (2003) also suggested that enhancing website quality is very critical for leading e-commerce success. Thus, website quality is essential for customer satisfaction (Bai et al. 2008; Lin 2007). In addition, complemented by mobile-ready site, website quality can be influenced by channel integration quality (Sousa et al. 2006).

H2a. *In electronic cross-channel commerce, perceived quality of channel integration is positively associated with website quality.*

H2b. *In electronic cross-channel commerce, website quality is positively associated with overall satisfaction with the retailer.*

The Influences of Mobile Application Characteristics

To articulate channel integration quality in electronic cross-channel commerce, we focus on mobile application characteristics consisting of two constructs: functional configuration and interactivity of mobile application.

Functional Configuration of Mobile Application

Functional configuration of mobile application is defined as the extent to which customer perceive the quality of functions or functional components offered through mobile application, associated with the website. In this study, we address functional extensibility and functional complementarity as potential indicators of functional configuration of mobile application. First of all, mobile application is designed with core functions used in the websites in addition to different mobile technology functions such as location-based services, near-field communications, and barcode scanning. Hence, functional extensibility refers to how much mobile application is extended through the addition of new functionality. And it can be one of reasonable reasons for people to use mobile devices rather than websites. *Second*, functional complementarity refers to the extent to which the basic functionality and essential features of mobile applications support or complement customers' e-commerce activities associated with the website. Specifically, providing complementary functions for customers to complete their intended activities is important to ensure superior customer experience (Mithas et al. 2007). With functional complementarity to the website, customers can accomplish preferred tasks through mobile applications. Therefore, we propose that functional configuration of mobile application enhances customers' perceived quality of channel integration in electronic cross-channel commerce.

H3a. *In electronic cross-channel commerce, functional extensibility of mobile application is positively associated with perceived quality of channel integration.*

H3b. *In electronic cross-channel commerce, functional complementarity of mobile application is positively associated with perceived quality of channel integration.*

Interactivity of Mobile Application

From a perception-based perspective, perceived interactivity is defined as the extent to which users perceive their experiences as a simulation of interpersonal interaction and sense they are in the presence of a social other (Thorson

et al. 2006; Zhao et al. 2012). In this study, we adopt this definition with regard to the context of electronic cross-channel commerce. Hence, interactivity of mobile application can be conceptualized as the extent to which people perceive the consistency across channels, particularly between mobile applications and websites (Sousa et al. 2006). Such interactivity of mobile applications has been considered a salient belief for improving channel effectiveness in cross-channel setting (Montoya-Weiss et al. 2003). The interactivity of mobile application has two dimensions: information consistency and visual consistency. The former refers to the consistency between information exchanged with the customer through different channels, including both outgoing and incoming information (Sousa et al. 2006). The latter refers to the consistency of the relevant and comparable visual attributes (e.g., visual aesthetics, image, font, order, or complexity) in mobile applications associated with the retailers' websites. Thus, interactivity of mobile application may increase a customer's uniform and comprehensive experience, by enhancing the integrated interactions across channels in cross-channel environments (Ganesh 2004; Sousa et al. 2006).

H4a. *In electronic cross-channel commerce, information consistency of mobile application is positively associated with perceived quality of channel integration.*

H4b. *In electronic cross-channel commerce, visual consistency of mobile application is positively associated with perceived quality of channel integration.*

Control Variable

To elucidate channel integration quality with mobile services, we employ perceived mobility as a salient control variable in this study. Perceived mobility allows people to access information at anywhere and anytime (Kim et al. 2010; Wu et al. 2005). It can be defined as the extent to which mobile technology is perceived as being able to provide pervasive and timely connections (Hong et al. 2008). Thus, user convenience resulting from perceived mobility can encourage people to use mobile services on a real-time basis rather than using web services on their desktop computers. Therefore, as a control variable, perceived mobility takes into account the variance for perceived quantity of channel integration with mobile services.

Research Methodology

The next step of the research is to empirically test my proposed research model. This study targets customer perceptions of using mobile applications which retailers launched for electronic cross-channel commerce. For instance, Amazon.com could be good survey site for this study. Hence, potential participants will be customers who use both website and mobile application for their e-commerce activities. To get appropriate dataset, we will recruit participants from an online panel like Amazon Mechanical Turk using HIT (Human Intelligence Task). It would be helpful to obtain the specific dataset we need.

The design of this study comprises two phases: *pilot* and *testing*. In the pilot phase, we will develop the measures for constructs used in the research model, and then conduct preliminary testing of the reliability and validity of the construct measures. For each construct, we will identify existing measures in the literature and adapt them to our research domain. Then, the survey instruments will be pilot tested on a representative sample of the target population and the instrument will be modified based on the feedback from the respondents. In the testing phase, we will use the construct measures developed in the pilot phase to test hypotheses proposed in the model. For this, we will conduct main survey and analyze data using the Partial Least Squares (PLS) statistical package. As a component-based structural equation technique, PLS is well suited for highly complex predictive models (Barclay et al. 1995; Chin 1998).

Discussion and Potential Implications

This study aims to develop a framework for effectively designing electronic cross-channel commerce environment, by understanding the effects of mobile application characteristics and channel integration quality. In this study, we set out to investigate (1) what characteristics of mobile applications enhance a customer's seamless experience across electronic channels (websites and mobile applications) and (2) how the integration quality between mobile applications and websites enrich customers' overall satisfaction with retailers. In detail, regarding a customer seamless experience as customers' perceived quality of channel integration, we hypothesize that the perceived quality of channel integration can be determined by mobile application characteristics (functional configuration and

interactivity of mobile application) in electronic cross-channel commerce. Then, we propose that channel integration quality impacts overall satisfaction with retailer, leveraging website quality.

This study may contribute to both theory and practice. The major theoretical contribution of this study is the development of a research framework suggesting the role of mobile applications in electronic cross-channel commerce. Considering a mobile application as a relatively new channel in e-commerce, this study is trying to extend the concept of cross-channel integrations, which has been studied the relationships between offline and online channels, into the context of electronic cross-channel commerce. In particular, considering the limitations of mobile device, this study suggests that two components of mobile characteristics such as functional configuration and interactivity of mobile applications may impact a customer's seamless experience across electronic commerce channels. Particularly based on environmental psychology and brand extension theory, our research framework leads the theoretical understanding of effective electronic cross-channel design, incorporating newly developed mobile technologies in electronic cross-channel commerce.

On the practical side, the current study may contribute to help practitioners like mobile application designers to articulate effective mobile applications. The influences of mobile application characteristics on channel integration quality elucidated in this study can be a major consideration in effective mobile application developments, particularly when retailers adopt mobile applications as an extension of existing channels like websites. This study also suggests that mobile applications designed for enriching a customer's seamless experiences in electronic cross-channel commerce enables customers to easily make sense and more involve in keep using the mobile applications for their e-commerce activities. Moreover, this study provides the practical insights for enabling practitioners to establish effective e-commerce strategy for their companies, incorporating mobile-based online market with existing online market, shedding lights on the understanding of relationships between mobile applications and websites as two important commerce channels.

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