The Effects of Location-based Mobile Marketing between Push and Pull on Usage Intentions

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Abstract—The purpose of this study is to investigate the effects of Location-Based Mobile Marketing (LBMM) between push and pull on usage intentions. We carried out a pretest carefully to confirm the representative variable of Push-LBMM. The pretest based on a between-subjects design. Results indicated that the effects of opt-in and opt-out on usage intentions were significantly different, and opt-in led to higher usage intentions. Therefore, we chose opt-in Push-LBMM to represent Push-LBMM in the formal experiment. We find that Pull-LBMM is associated with higher usage intention as compared to Push-LBMM. We also find that technology acceptance plays a mediating role in the relationship between LBMM and usage intentions. Based on experimental results, theoretical and managerial implications are also discussed.

Index Terms—Location-based Mobile Marketing (LBMM), technology acceptance, usage intension

I. INTRODUCTION

The recent years have seen a new form of marketing, called Location-based Mobile Marketing (LBMM). This marketing method relies on an integrated use of Global Positioning System (GPS) and Geographic Information System (GIS) technologies to offer marketing information to consumers based on their current locations [1]. Unlike the traditional retail methods, LBMM uses mobile phones as the medium of communication to provide location-specific information instantly based on consumer’s preferences and needs. Therefore, it has been recognized as an effective marketing approach.

In response to this market tendency, many businesses have developed their own LBMM services. For instance, Jiepang (http://jiepang.com) partnered with Starbucks in 2010 to create a win-win situation for both Starbucks and consumers by introducing a program that encourages and rewards togetherness of consumers. Many local companies, such as Chunshuitang and Vieshow Cinemas, are working with Chunghwa Telecom to push promotional text or multimedia messages to consumers and capture consumers’ needs as consumers come near their stores. Location detection in this marketing approach is achieved by making use of Chunghwa Telecom’s base stations. Despite the promising future of LBMM, it is still at a fledgling stage in Taiwan mainly because consumers’ lack of knowledge about LBMM has limited their intentions to use it. Therefore, how to increase consumers’ knowledge of the benefits of LBMM and motivate their use of LBMM is a challenge for businesses [2]. The relationship between LBMM and consumers’ usage intentions is the main issue of this study.

In LBMM, information is provided in two approaches, namely Push and Pull [3] and [4]. The Push approach is to track the location of users of mobile devices and send location-specific information to them without their request for the information. In contrast, the Pull approach is to deliver location-specific information only on user demand. In the present, consumers in Taiwan still have limited knowledge of the benefits of these two marketing approaches, and little domestic research has addressed this issue as well. Hence, the focus of this study is to explore the effects of the two LBMM approaches on usage intentions. Besides, previous research has shown that the Pull approach, as compared to the Push approach, has higher perceived value as it offers higher customization and creates less irritation [5]. However, Institute for Information Industry (III) pointed out that due to cultural differences, Taiwanese consumers do not have the habit to seek information actively, so consumers’ intentions to use pull LBMM have been inhibited. This is also a question to clarify in this study.

Despite the fact that information systems are extensively applied to management of time and financial resources, there is usually an enormous gap between expectation and perception of the performance of a new information system [6] and [7]. As a result, user acceptance has been recognized as a key foundation of most information management programs [8] and a challenging issue [9]. Davis and his research fellows [10]-[13] found that Technology Acceptance Model (TAM) can be extensively applied to explaining the psychology behind technology adoption [14] and [15].

Manuscript received October 5, 2015; revised December 17, 2015.

doi: 10.12720/jait.7.2.134-139

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They suggested that some exogenous variables (e.g., system experience, education, and age) affect actual use only through perceived usefulness (PU) and perceived ease-of-use (PEOU). Some scholars have also obtained findings that support the influence of PU and PEOU [16] and [17]. In light of rapid development of mobile technology, we find it necessary to analyze the mediating effects of PU/PEOU on LBMM and answer questions left unaddressed in previous research.

II. THEORETICAL BACKGROUND

A. Development of Mobile Marketing

The population of mobile phone users around the world has exceeded 4 billion. Even in Africa, the penetration rate of mobile phones is around 40%. This rate is above 40% in many other nations, including Australia, New Zealand, Denmark, Ireland, Norway, Netherlands, Spain, Sweden, Switzerland, and England. The rate for the market in the USA is greater than 75%. In Hong Kong, Japan, and Western Europe, it has even exceeded 100% as many subscribers possess multiple mobile devices [18]. The high penetrations of mobile phones have made mobile phones an important platform of communication between retailers and consumers. Marketing via this platform is called as “mobile marketing.” According to Mobile Marketing Association, mobile marketing is a set of practices that enable organizations to communicate and interact with their audience through any mobile device or network. Shankar and Balasubramanian [19] defined mobile marketing as “the two-way or multi-way communication and promotion of an offer between a firm and its customers using a mobile medium, device or technology.” We can infer that interactive mobile marketing models will be increasingly important in the retail environment.

As corporate investment in traditional media such as newspapers, magazines, radio, and television as an advertising platform has drastically decreased by 10-20%, there is an 9.2 and 18.1% increase in Internet and mobile advertising respectively [20]. Previous research of coupon delivery indicates that the redemption rate of print coupons has declined, and that of mobile and Internet coupons is comparatively higher [20] and [21]. Driven by the prospect of mobile marketing, many businesses are now using mobile marketing strategies to meet market demands [20] and [22]. Estimates from eMarketer indicate that the advertising budget of advertisers is expected to increase from the current $1.88 billion to $3.08 billion by 2017, with a growing ratio of budgets going to mobile advertising. In Taiwan, the population of mobile phone users has exceeded 29.45 million, and the penetration rate of mobile phones has also reached 126.2% as of September 2013. III found in a survey on consumers’ buying decisions that about 25% of consumers have reduced their reception of traditional advertising messages, and 33-40% of the respondents have the habit to receive advertising messages via mobile phones and the Internet [23]. III also pointed out that the mobile services market is having a steady growth and will reach the maturity stage in five years.

Mobile marketing is not limited to marketing via text and multimedia messages. It also includes mobile application (App) marketing, Quick Response Code (QR Code) marketing, Bluetooth marketing, and location-based mobile marketing (LBMM). LBMM is a form of advertising that uses location positioning technology to provide instant and customized location-specific information to mobile device users [1]. According to III, LBMM is a form of mobile advertising that delivers messages that most consumers perceive as more positive and useful. Consumers are also more willing to check out more information about messages advertised through this method. Interactive Advertising Bureau [24] saw an increase in revenue from mobile advertising by 150% compared to the previous year and projected a huge growth of mobile marketing coupled with location-based services. In response to this trend, many businesses in all sectors have been driven to boost their customer flow and sales by using LBMM [25].

B. Location-Based Mobile Marketing

LBMM is a form of marketing communication that uses location-tracking technology in mobile networks to target consumers with location-specific advertising on their mobile devices [3]. It is an application of location-based services (LBS), which is also an important innovative marketing technology. Through LBS, firms can deliver promotional information to consumers’ mobile devices in a solicited or unsolicited manner, and consumers can check out or save the information instantly as long as they are within a specific area. As LBMM caters to consumers’ individual needs, it can lead to higher sales performance, brand loyalty, and customer lifetime value [19]. Business analysts have estimated that the advertising effect of LBMM is at least 20 times greater than that of the Internet [26]. A survey on US consumers shows that 78% respondents use location-based applications on their phone, and 34% would click on ads in response to location-specific messages [27]. This result suggests a huge market potential for LBMM. According to Allied Business Intelligence Inc. [28], the business revenue generated by LBMM would grow from US$170 million in 2008 to approximately US$140 billion in 2014.

LBMM advertises messages based on consumers’ location and preferences. It can help consumers find the best deals offered by nearby stores, so more and more consumers are willing to share their location information in exchange for the benefits of LBMM [20]. Applications of LBMM in the retail industry can be divided into two types, namely the push type and the pull type [3] and [4]. In Push-LBMM, the advertiser works with the mobile phone carriers to detect the location of its users and push messages directly to users. In this push approach, there are two ways that messages can be delivered, namely opt-in and opt-out. Opt-in suggests that users authorize the advertiser to send ads to them, so it is also called permission-based marketing. This marketing approach facilitates development of a better relationship between
the advertiser and mobile phone users. Opt-out suggests that the advertiser sends ads to mobile phone users until the users ask not to receive any ads from the advertiser [29]. The Pull-LBMM approach, in contrast, is to detect user location and send messages or deliver services only when the user requests for them [3]. As the push approach gives marketers a greater control over the advertising process, it is considered an effective approach to inducing impulse buying [3]. However, given a relatively smaller control over push ads, consumers are more likely to have negative evaluations of Push-LBMM [30]. Compared to Push-LBMM, Pull-LBMM allows for more customer participation and usually sets a limitation on the scope of customer consent, so it is considered more reliable and effective [31] and [32]. After acquiring customer consent, retailers can deliver very targeted advertising messages to enhance their business performance [33]. Ref. [34] found that consumers are more influenced by the ads they search for than by unsolicited ads when making a buying decision [35]. It can be inferred that Pull-LBMM is better than Push-LBMM in terms of advertising effectiveness. Previous research has noted that Pull-LBMM is more positively related to the perceived risk of information disclosure [36]. In Push-LBMM, given lower control over LBMM and fewer interactions with the advertiser, consumers are more likely to receive irritating messages and therefore perceive a lower value in this marketing approach [5] and [30]. In contrast, LBMM has a higher perceived value. Therefore, we propose H1.

Besides, Technology Acceptance Model (TAM) [10] and [12] proposes that “beliefs, attitudes, intentions, and behaviors” have a causal relationship with potential adopters’ acceptance. In this model, perceived usefulness (PU) and perceived ease-of-use (PEOU) influence attitude toward using, which in turn affects intentions to use. Previous research has documented findings supporting that these two beliefs are the correlates of consumer behavior. For instance, it is found that PU is a key factor affecting adoption of a new technology or information system [10]-[14] and also has a significant effect on consumers’ attitude toward using and intentions to use an online store [37]-[40]. In addition, PEOU is positively related to attitudes toward using an online store [37]-[41]. Findings in Gefen and Straub [42] also suggest that PEOU has a direct effect on intentions to use a new information technology. Since the focus of previous research has been placed mainly on the effect of technology acceptance on usage intentions, we will further examine the effect of PU and PEOU as mediators. We propose H2a and H2b as follows.

- **H1:** Compared to Push-LBMM, Pull-LBMM can create higher intentions to use.
- **H2a:** Compared to Push-LBMM, Pull-LBMM is associated with higher technology acceptance.
- **H2b:** LBMM influences intentions to use through technology acceptance.

### III. PRETEST

This study is intended to explore and compare the effects of the two approaches of LBMM, namely Push-LBMM and Pull-LBMM, on intentions to use. Previous research has confirmed the importance of LBMM for today’s businesses. In this study, we attempted to obtain practical implications of LBMM in Taiwan’s retail market, so we conducted the experiment on mobile phone users in the retail market. Through the experiment, we could also analyze whether technology acceptance mediates the relationship between this new marketing model and intentions to use. As mentioned earlier, Push-LBMM includes opt-in and opt-out approaches [29]. To confirm the representative variable of Push-LBMM, we carried out a pretest carefully as follows:

#### A. Method and Procedure

A single-factor (Push-LBMM: opt-in vs. opt-out) between-subjects design was adopted. 44 marketing undergraduate students at a university of science and technology in Southern Taiwan participated in Pretesting exchange for course credit. All the participants were escorted to a store layout and planning laboratory, they had to be randomly assigned to the opt-in and opt-out scenarios. In the opt-in scenario, they were asked to imagine that a popular convenience store on campus is planning to launch the mobile coupon subscription service. It encourages consumers to join the program as follows: “Whenever you come into any area within one kilometer radius of the store, we will send ads of promotional items of the day to your mobile phone. If you agree to subscribe to this service, please provide your name and telephone number. We will sign you up. Enjoy your shopping.” Later, we demonstrated the form of approval to receive mobile coupons and a sample of mobile coupons to all the participants. In the opt-out scenario, the participants were also asked to imagine that a popular convenience store on campus is planning to introduce the mobile coupon subscription service. The service is as follows: “Whenever you come into any area within one kilometer radius of the store, we will send promotional messages based on your location to your mobile device. If you dislike the type of messages we send to you, please call our customer center or send a message to us to cancel your subscription.” Finally, all the participants were asked to answer the questionnaire and provide their basic data.

According to previous research [31] and [36], we designed three questions for opt-in and opt-out Push-LBMM respectively. The dependent variable, that is, usage intentions, was measured using three questions adapted from the usage intention scales introduced by Engel, Blackwell, and Miniard [43], Xu, Oh, and Teo [4]. To avoid central tendency of responses, all the questions were designed to be evaluated on a six-point Likert scale (from 1-very disagree to 6-very agree).

#### B. Results

The average reliability of the three questions for opt-in and opt-out was first evaluated ($\alpha_{opt-in} = 0.77$; $\alpha_{opt-out} = 0.94$). The one-sample t-test showed a value greater than 4 for both scenarios ($M_{opt-in} = 4.87$ vs. $M_{opt-out} = 4.00$), suggesting that our manipulation of opt-in Push-LBMM
IV. FORMAL EXPERIMENT

A. Method and Procedure

The valid sample consisted of 87 participants recruited at the business district around Kaohsiung Arena. 61.2% were female, and the average age was 27.84. All the participants had at least two-year experience of using smartphones. Each participant was given NT$30 (NT= New Taiwan dollar) after the experiment. A single-factor (LBMM: Push vs. Pull) between-subjects design was adopted to test H1. The participants were randomly assigned to the Push-LBMM scenario and the Pull-LBMM scenario.

In the Push-LBMM scenario, the participants were asked to imagine that a popular convenience store in the business district is planning to launch the mobile coupon subscription service. The service detail is as follows: “Whenever you come into any area within one kilometer radius of the store, we will send ads of promotional items of the day to your mobile phone. If you agree to subscribe to this service, please provide your name and telephone number. We will sign you up. Enjoy your shopping.” Later, we demonstrated a form of approval to receive mobile coupons and a sample of mobile coupons to all the participants. Finally, we asked them to fill out the questionnaire and provide their basic data.

In the Pull-LBMM scenario, the participants were asked to read the instructions of a mobile application (App) called “hks Good Deals.” The participants were told to imagine the following scenario: They come to an unfamiliar place and want to know about the locations and promotional messages of nearby convenience stores. They launch “hks Good Deals” on their mobile device and then use the GPS positioning function to find their current location. Later, they click on “nearby offers” to view promotional messages of nearby stores. Meanwhile, they were also presented with a sample of mobile coupons. Finally, they had to answer a questionnaire and provide their basic data.

According to previous research [31], we designed three questions for Push-LBMM and Push-LBMM respectively. The dependent variable, that is, usage intentions, was measured using three questions adapted from the usage intention scales introduced by Engel, Blackwell, and Miniard [43], Xu, Oh, and Teo [4]. Besides, we also designed six questions to measure technology acceptance based on Adams, Nelson, and Todd [44], Straub, Keil, and Brenner [45], Deane, Podd, and Henderson [46], Moon and Kim [41], Heijden [47], and Saade and Bahli [48]. To avoid central tendency of responses, all the questions were designed to be evaluated on a six-point Likert scale (from 1-very disagree to 6-very agree).

B. Results

Manipulation Check: The average reliability of the three questions for each independent variable was assessed first (αpush = 0.70; αpull= 0.76). Later, the one-sample t-test showed a value greater than 4 for each group (Mpush-LBMM= 5.01 vs. Mpull-LBMM = 5.30), indicating successful manipulation of Push-LBMM (t (40) = 8.51, p<0.001) and Pull-LBMM (t (45) = 13.04, p<0.001).

Hypothesis Testing: To validate H1, the average reliability of the three questions for usage intentions was assessed (α= 0.94). Later, the one-way ANOVA indicated a significant difference between Push-LBMM and Pull-LBMM in terms of effect on usage intentions (F (1, 85) = 11.22, p<0.001). Compared to Push-LBMM, Pull-LBMM was associated with higher usage intentions (Mpull-LBMM = 3.98 vs. Mpull-LBMM = 4.81). Hence, H1 was supported. We further tested H2a and H2b, which propose that LBMM influences usage intentions through technology acceptance beliefs. We first assessed the average reliability of the six questions for technology acceptance (α= 0.90) and then performed a one-way ANOVA. Results indicated a significant difference in main effect between the two LBMM approaches (F (1, 85) = 6.41, p<0.05), and Pull-LBMM was associated with higher technology acceptance (Mpull-LBMM = 5.03 vs. Mpush-LBMM = 4.60). Hence, H2a was supported. We further carried out a bootstrapping analysis [49], [50] to explore the relationship among LBMM, technology acceptance, and usage intentions using 5000 bootstrap samples. The indirect effect was significant (β = 0.32, 95% CI: 0.09, 0.62) at 95% confidence interval (CI) excluding 0. This result conformed to complementary mediation suggested by Zhao, Lynch, and Chen [51]. H2b was supported.

V. GENERAL DISCUSSION

The results of this study indicate that Pull-LBMM can lead to higher usage intentions. Because Push-LBMM involves tracking of users’ locations without any limitation, consumers may perceive higher risk of using Push-LBMM and have reduced intention to use it. Pull-LBMM, in contrast, tracks users’ location only on their demand. It allows users to have their information need satisfied instantly. As a result, it is associated with higher perceived value and usage intentions. According to III, Taiwanese consumers do not have the information-seeking habit, and the absence of such habit may hinder their use of Pull-LBMM. However, the participants in our experiment gained a deeper understanding of the characteristics of LBMM through our scenario simulation. They showed significantly higher intentions to use Pull-LBMM than to use Push-LBMM. Therefore, we infer Taiwanese consumers’ intentions to use LBMM are mainly inhibited by a lack of knowledge about mobile...
marketing than by the absence of an information-seeking habit. Moreover, the empirical evidence in this study confirms that technology acceptance plays a mediator role in consumers’ use of LBMM. Technology acceptance mediates intentions to use LBMM among consumers.

A. Theoretical Contributions and Managerial Implications

Previous research has shown that mobile marketing affects consumer evaluations [30], and consumers have a stronger preference for Pull-LBMM [32]. However, little research has explored the effects of different LBMM types on consumer behaviors, and there is limited evidence that can be generalized to the entire Asian society. In this paper, we conducted a comparative analysis of two major types of LBMM and empirically confirmed that Pull-LBMM is associated with higher usage intentions. This finding contributes to existing literature and also responds to the call for verifying the generalizability of existing findings to consumer behaviors in Taiwan.

This finding fills the gap in literature about the effectiveness of mobile marketing for physical stores. In addition, previous research of PU and PEOU is mainly focused on consumers’ attitude and intentions toward using virtual stores [37]-[40]. In this paper, we provide empirical evidence of the mediating role of these two beliefs in consumers’ intentions to use LBMM in a physical store context.

To better understand consumers’ intentions to use LBMM, we conducted the experiments at a convenience store located in a business district. Our empirical results can be a reference for the retail industry in Taiwan. On the other hand, despite the prevalence of IT applications in Taiwan, application of LBMM in the retail industry can increase consumers’ attention to the perceived value of this technology. As to technology acceptance, our evidence confirms its mediating effect. This implies that the perceived value of LBMM should be considered in marketing strategies that involve application of LBMM.

B. Limitations and Future Research

The experimental scenarios involve a convenience store that offers the mobile coupon subscription service. As the benefits for consumers vary across industries, the effectiveness of LBMM may also differ. Hence, the experimental results may not be generalizable to other sectors. Further researchers can compare the effectiveness of LBMM for different store types or consider multiple types of promotional messages in the research to obtain more insights into the effectiveness of LBMM. Besides, we considered only the opt-in Pull-LBMM and Push-LBMM. Future researchers can perform a comparative analysis of all the three approaches of LBMM.

REFERENCES


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