

## Determinants and Their Measurements of Mobile Marketing Performance

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**Abstract**—Practice shows that many enterprises could not achieve remarkable performance in mobile marketing mainly because consumers' intention to accept it is very low. According to the literature research, the article considered consumer intention to accept mobile marketing as a measurement indicator of mobile marketing performance. Then the article explored the determinants of consumer's intention to accept mobile marketing and built a conceptual model. The model included five determinants: technology, consumer innovativeness, personalization, permission and entertainment; two mediators: perceived ease of use and perceived usefulness; one outcome variable: intention. The article constructed the measurements of those variables and used SPSS software to carry out the reliability analysis and the exploratory factor analysis. Finally, the article confirmed the measurements of variables which would be applied in future research.

**Keywords**—mobile marketing; performance; determinant; measurement

### I. INTRODUCTION

The mobile users are expanding in recent years in China. According to the latest statistic data of MIIT of PRC, in November 2012, the mobile users have reached 1,104.215 million [1]. With the rapid developing of mobile communications industry and increasing size of mobile users, many enterprises have begun to pay attention to the application of mobile devices in the field of business. For example, from September 5 to October 15 in 2011, Coca-Cola carried out promotional activities in Beijing through mobile phone. During the period, any consumer bought a bottle of 2 liter promotional bottled Coca-Cola, Sprite or Fanta, could participate in the promotional activity "drink Coca-Cola soft drink products, win a travel voucher worth of 4,999 yuan" and have a chance to win other corresponding prizes. Consumers only need to send short message "COKE # 8-bit encoding" to 12114 based on the 8-bit encoding inside the cap. The campaign attracted a large number of consumers to participate and greatly enhanced the company's sales. In addition, when consumers sent short message to participate in the activities, Coca-Cola as the organizer of the activities could collect a lot of consumer information at the same time. According to analyzing consumer information, Coca-Cola could have an intuitive understanding of the condition of activities and provide data support for future adjustment of sales strategy. However, although many enterprises have already made remarkable

achievements in carrying out mobile marketing, but most of enterprises could not achieve significant performance in mobile marketing. Usually, some enterprises do not know how to well-designed mobile marketing campaigns, and only be able to take a simple and low-end bulk SMS sending. Some enterprises were blacklisted for sending unsolicited spam messages and causing consumers' antipathy. Others were even punished for touching the law. Thus, how to take full advantage of the integration of the rapid development of internet technology and mobile communications technology to conduct mobile marketing, how to encourage consumers to participate in mobile marketing and how to enhance the performance of mobile marketing, is a puzzle put in front of a lot of enterprises. The article mainly studied the determinants of mobile marketing performance and determined their measurements which would be applied in future research.

### II. THEORETICAL BACKGROUNDS

Mobile Marketing refers to any form of marketing, advertising or sales promotion activities which target consumers and carry out through mobile channels [2]. The article mainly studied the factors impacting performance of the mobile marketing. Following are some researches related to the article.

#### A. The Research on the Measurement of Mobile Marketing Performance

Many researchers put forward their own measurements from various angles about the measurement of the performance of enterprises' management and business activities. Kaplan et al. (1992) concluded that the performance of the operating activities could be measured from four perspectives including finance, customer, innovation, learning and internal point of view [3].

The measurements of operating performance were also used to measure the success and performance of e-commerce. According to the point of view of Kaplan et al. (1992), the enterprises could use tactical and strategic results to measure the performance of e-commerce. The measurements could be more objective method such as click-through rate [4]. Web browsing was considered a better measurement, because it contained a time dimension and could be used to measure the pages viewed by the visitors in a period of time.

Customer satisfaction was a representative measurement used to measure the performance of mobile commerce

systems [5]. Many dimensions being used to measure the performance or success of e-commerce were also suitable for measuring the performance or success of mobile commerce. In the theoretical research, the researches which directly studied the measurement dimensions of mobile marketing were extremely rare. However, there were many organizations in their efforts to define or measure the success factors of mobile data services, which undoubtedly provide a significant reference for the research on performance of mobile commerce and mobile marketing. In 2004, Arthur D. Little Corp. surveyed 161 German companies and showed that there were 27% of the companies could not evaluate the success of the company's mobile data services. The model proposed by Arno et al. for evaluating the success of SMS advertisement showed the relationships between the success factors and the success measurement factors including consumer beliefs, consumer intention and consumer behavior. [6].

Based on above views, the article mainly measured the mobile marketing performance from the consumer perspective and adopted consumer intention as performance indicator. Phenomenon showed that as a new marketing model, for many enterprises, it was very difficult to obtain good performance when carried out mobile marketing. The main reasons were that consumers did not accept this kind of marketing activity, even expressed resentment and complaints. In order to make enterprises' mobile marketing achieve good results, the key is to let consumers willing to receive mobile marketing messages, actively participate in interactive mobile marketing campaigns and initiatively login enterprises' mobile websites to inquire product information or download mobile coupons. Thus, it is practically rational to consider consumer intention as a measurement of mobile marketing performance.

#### *B. The Research on Consumers' Intention to Accept Mobile Marketing*

In the past researches, four factors were identified and proven to have a significant impact on consumers' acceptance of mobile marketing: permission, content, control of wireless service provider and information sending. Some researches pointed out that consumers' intention to accept mobile advertisement through mobile phone was mainly driven by four factors: the task of mobile media in the marketing mix, the development of technology, the one-to-one marketing media and related rules and regulations [7]. A survey of mobile phone users showed that consumers believed that the benefits of mobile marketing were to save money, to save time and to provide useful information. Consumers thought permission was a decisive factor to participate in mobile marketing. Studies had shown that the purpose of many consumers using mobile phones to access to information was mainly to get entertainment or to pass the time [8]. Other factors of consumers themselves also had impact on mobile marketing. The innovative consumers had higher intention than backward consumers. The understanding of the value-added services also helped consumers to use the related services.

### III. CONCEPTUAL MODEL AND HYPOTHESES

In this section, hypotheses and a conceptual model were developed based on the previous discussion on consumer acceptance of mobile marketing.

#### *A. Technology Factor*

In real life, technologies of information transmitting, mobile devices and network have greater impact on consumers using mobile marketing services. Sometimes, because of bad signal, always break and low speed in mobile communication, consumers could not accurately receive information or participate in mobile marketing campaigns quickly and in a timely manner. Accordingly, their enthusiasm to participate in mobile marketing greatly reduced. In addition, because smart phone has certain properties such as XHTML scanning, location integrating and smoothly running in different networks and usually a larger screen, consumers with smart phones are more often involved in enterprises' mobile marketing campaigns such as quiz, the applications of two-dimensional bar code and mobile phone games. Technology also can affect the perceived ease of use when consumers participate in mobile marketing campaigns. For example, the users of iPhone are easier to login corporate mobile site, and because they could download some corporate client software, they are also more likely to participate in the interactive marketing activities of enterprises. So technology affects perceived ease of use of mobile services, and thereby affects consumer intention to accept mobile marketing. Accordingly, the article considered perceived ease of use as a mediator between technology and intention, and put forward the following hypotheses:

H1: Technology positively affects intention.

H2: Technology positively affects perceived ease of use.

#### *B. Consumer Factor*

According to innovation diffusion theory, the adoption and the trial of new technologies was related to the tendency of individual acceptance of new products. Some people had exclusive and skeptical attitude to almost all new things, but some people took an open and receptive attitude and the latter usually had higher innovativeness. As mobile marketing involves the use of new technology, hence the consumers' intention to adopt it is vulnerable to the impact of consumers' innovativeness. In addition, the fear of new things of those consumers with stronger innovativeness is often weak. So, their perceived ease of use is also stronger when use new technologies. Accordingly, the article considered perceived ease of use as a mediator between consumer innovativeness and intention and put forward the following hypothesis:

H3: Consumer innovativeness positively affects perceived ease of use.

H4: Consumer innovativeness positively affects intention.

#### *C. Marketing Factor*

Many enterprises designed personalized information to associate with consumers' demand based on their time,

location and preferences such as providing the nearest restaurant information according to consumer's demand. Consumers are often more familiar with the related information and activities, so their perceived ease of use would be stronger when receive those related mobile marketing information or participate in related activities. Personalized marketing information and activities are also more useful for consumers. On the other hand, many consumers believe that mobile advertisement is a disturbance just as the online advertisement, so they circumvent mobile advertisements through some cognitive, behavioral and mechanical means. But some mobile marketing information sent by enterprises provided permission or unsubscribe conditions for consumers, so the enthusiasm of consumers to participate in these enterprises' mobile marketing was higher. Of course, the information permitted by consumers to accept is generally useful information to consumers. In addition, the main purpose of many consumers to use mobile data services is to acquire entertainment. For example, consumers can get entertainment and relaxation through playing mobile phones games. Because the basement of mobile marketing is mobile data services, thus, the entertainment of mobile marketing information and activities has a very significant impact on consumers' intention to accept mobile marketing. Entertaining information and activities could meet the entertainment needs of consumers and help them to relax, so, in essence, these entertainment marketing information and activities is also useful to consumers. Accordingly, the article considered perceived ease of use and perceived usefulness as mediators and put forward the following hypotheses:

H5: Personalization positively affects perceived ease of use.

H6: Personalization positively affects intention.

H7: Personalization positively affects perceived usefulness.

H8: Permission positively affects intention.

H9: Permission positively affects perceived usefulness.

H10: Entertainment positively affects intention.

H11: Entertainment positively affects perceived usefulness.

#### D. Perceived Ease of Use, Perceived Usefulness and Intention

TAM theory concluded that perceived usefulness and perceived ease of use had significant impact on intention, and perceived ease of use had significant impact on perceived usefulness. The conclusions of TAM2 included the conclusions of TAM that perceived ease of use had significant impact on perceived usefulness. That was to say, if the technical system was easier to use, it would be easier to improve work performance. As mentioned in TAM, the researches in the field of mobile marketing and mobile commerce also concluded perceived ease of use had direct impact on intention, and had indirect impact on intention through perceived usefulness. Accordingly, the article put forward the following hypotheses:

H12: Perceived ease of use positively affects intention.

H13: Perceived usefulness positively affects intention.

H14: Perceived ease of use positively affects perceived usefulness.

#### E. The Conceptual Model

On the basis of reviewing literatures, the article put seven variables into the conceptual model including technology, consumer innovativeness, personalization, permission, entertainment, perceived ease of use, perceived usefulness and intention. The model displayed the relationships between the various factors and mobile marketing performance just as shown by Fig. 1.

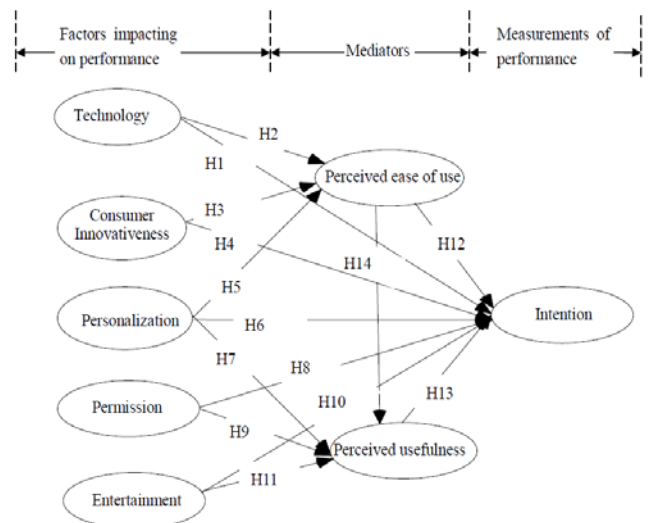


Fig. 1. The Conceptual Model

As shown by Fig. 1., technology, consumer innovativeness and personalization are antecedents of perceived ease of use, which will not only directly affect intention, but also indirectly affect intention through mediating variables including perceived ease of use and perceived usefulness; personalization, permission and entertainment as antecedents of perceived usefulness will not only directly affect intention, but also indirectly affect intention through perceived usefulness; perceived ease of use and perceived usefulness directly or indirectly affect intention.

#### IV. CONSTRUCT AND CONFIRM MEASUREMENTS

Mobile marketing research has nearly a decade of history in west countries and there are some high reliability and validity measurements developed. In this article, original measurements were constructed and shown in Table 1. After constructing the measurements, the study randomly selected 70 students in a university in Guangdong for the pretest. In the pretest, 62 copies were returned and the recovery rate was 88.57%. Among the returned copies, there were 12 invalid questionnaires and 50 valid questionnaires. The effective rate was 80.65%.

Then, the article carried out the reliability and validity analysis of the measurements based on the analysis process of pre-test questionnaires of Wu (2010) [9]. When carried out the validity analysis, the article mainly adopted principal

component analysis and the varimax rotation of orthogonal rotation in the process of exploratory factor analysis (EFA). The concrete results were shown in Table 1.

TABLE I. THE RESULTS OF EFA

Variables and Measurements	Component Extraction	Total	% of variance	Cumulative	KMO
<i>Technology</i>		2.744	68.607	68.607	0.693
TECH2	0.896	0.803			
TECH1	0.870	0.756			
TECH3	0.812	0.659			
TECH4	0.725	0.525			
<i>Consumer innovativeness</i>		2.902	58.039	58.039	0.750
IN5	0.890	0.792			
IN1	0.764	0.584			
IN4	0.757	0.573			
IN3	0.741	0.549			
IN2	0.635	0.403			
<i>Personalization</i>		3.539	70.779	70.779	0.779
PERS2	0.896	0.803			
PERS5	0.858	0.737			
PERS3	0.836	0.699			
PERS4	0.808	0.653			
PERS1	0.805	0.648			
<i>Permission</i>		1.894	63.141	63.141	0.653
PERM2	0.829	0.687			
PERM3	0.825	0.680			
PERM1	0.726	0.527			
<i>Entertainment (The first EFA)</i>		3.189	63.787	63.787	0.792
ENJ1	0.921	0.849			
ENJ2	0.914	0.835			
ENJ3	0.862	0.744			
ENJ4	0.823	0.678			
ENJ5	0.288	0.083			
<i>Entertainment (The second EFA)</i>		3.131	78.274	78.274	0.795
ENJ1	0.932	0.868			
ENJ2	0.925	0.856			
ENJ3	0.858	0.736			
ENJ4	0.819	0.670			
<i>Perceived ease of use</i>		2.110	52.762	52.762	0.618
PEOU2	0.814	0.662			
PEOU3	0.753	0.567			
PEOU1	0.673	0.453			
PEOU4	0.655	0.429			
<i>Perceived usefulness</i>		3.716	74.315	74.315	0.867
PU3	0.904	0.817			
PU5	0.877	0.770			
PU4	0.851	0.724			
PU1	0.847	0.718			
PU2	0.829	0.687			
<i>Intention (The first EFA)</i>		2.828	56.551	56.551	0.776

BI3	0.904	0.817
BI1	0.864	0.747
BI2	0.832	0.693
BI5	0.605	0.366
BI4	0.453	0.205
<i>Intention (The second EFA)</i>		2.685 67.119 67.119 0.775
BI3	0.905	0.819
BI1	0.888	0.788
BI2	0.841	0.707
BI5	0.609	0.371

Table 1 showed that the KMO value of each variable was above 0.5, so it was suitable for using factor analysis. It indicated that the probability was less than significant level 0.05 and the null hypothesis was rejected. That showed the correlation coefficient matrix was significantly different from the unit matrix, so it was not a unit matrix and could extract factor. Under the condition of the number of factors being not limited, each variable successfully extracted a common factor. For only extracted a common factor, therefore, it need no shaft program and there was no rotated component matrix appeared in the output. Table 1 showed the factor loadings of the items of each variable were greater than 0.4 except ENJ5, so the extracted common factors could effectively reflect the indicators. The common factors were named as technology, consumer innovativeness, personalization, permission, entertainment, perceived ease of use, perceived usefulness and intention. Intention could meet the requirement in the first exploratory factor analysis, but because BI4 was not accepted in the reliability test (see Table 2), therefore BI4 item was deleted and carried out second exploratory factor analysis. The measurements which had been excised shaded items had higher validity level.

TABLE II. THE RESULTS OF RELIABILITY ANALYSIS

Variables and Measurements	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
<i>Technology</i>			0.846
TECH1	0.738	0.780	
TECH2	0.788	0.757	
TECH3	0.661	0.816	
TECH4	0.561	0.853	
<i>Consumer innovativeness</i>			0.816
IN1	0.613	0.780	
IN2	0.477	0.816	
IN3	0.587	0.786	
IN4	0.596	0.785	
IN5	0.780	0.722	
<i>Personalization</i>			0.896
PERS1	0.696	0.883	
PERS2	0.817	0.855	
PERS3	0.740	0.873	

PERS4	0.703	0.882
PERS5	0.767	0.868
<i>Permission</i>		0.703
PERM1	0.445	0.702
PERM2	0.572	0.558
PERM3	0.556	0.566
<i>Entertainment</i>		0.907
ENJ1	0.869	0.851
ENJ2	0.855	0.856
ENJ3	0.751	0.894
ENJ4	0.697	0.911
<i>Perceived ease of use</i>		0.698
PEOU1	0.430	0.666
PEOU2	0.584	0.565
PEOU3	0.509	0.618
PEOU4	0.413	0.677
<i>Perceived usefulness</i>		0.913
PU1	0.759	0.898
PU2	0.735	0.903
PU3	0.840	0.880
PU4	0.762	0.897
PU5	0.800	0.890
<i>Intention</i>		0.798
BI1	0.708	0.716
BI2	0.675	0.726
BI3	0.786	0.688
BI4	0.312	0.832
BI5	0.438	0.800

According to the results of reliability analysis shown in Table 2, the Cronbach's Alpha after deleting TECH4 item was 0.853 and was slightly higher than the Cronbach's Alpha of technology, but the increase was not obvious, so it was not necessary to remove the item. The Cronbach's Alpha after deleting BI4 was 0.832 and was significantly higher than the Cronbach's Alpha of intention, so BI4 was deleted and the second exploratory factor analysis was carried out. The results of the second exploratory factor analysis met the requirements (see Table 1). Besides that the Cronbach's Alpha of perceived ease of use was 0.698 and slightly less than 0.7, all the Cronbach's Alpha of the measurements were greater than 0.7. It indicated that the reliability of the measurements was good.

## V. CONCLUSION

The article considered intention as a measurement of the performance of mobile marketing from a consumer perspective. Base on reviewing literatures, the article studied the factors impacting consumer intention and the performance of mobile marketing. The article constructed measurements of those factors and carried out an exploratory factor analysis to test the validity of measurements and confirm some common factors including technology, consumer innovativeness, personalization, permission, entertainment, perceived ease of use, perceived usefulness and intention which were shown in table 1. Also, the article used Cronbach's Alpha to carry out the reliability analysis which was shown in table 2. Finally, the article deleted some items which were shaded in table 1 and table 2, and confirmed the measurements which would be used in future research. The common factors and their measurements could provide complement for the existing mobile marketing research.

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