Mobile-Commerce (M-commerce) based Personalized Services for Consumers in India: Pragmatic Study

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Abstract:
In order to attract more M-commerce consumers in India our present study is based on personalized services. Study is significance to the mobile service and M-commerce service providers who want to know if they can use personalized services to attract consumers. Even an increased number of new subscribers may indicate client preference for personalized services and their attractiveness to advertisements on web or mobile. Four main constructs – **usefulness of personalized services**, **amount of messages through advertisement**, **search engine efficiency**, **privacy infringement** from personalization have been studied. For the purpose of analysis, service subscribers' intention to switch to a new service provider with personalized services is selected as the dependent variable. This empirical study indicates that all four constructs are significant in affecting the decision by subscribers to change to a new mobile service provider. It is found that too many advertisement messages confuse the customers related to relevant information contained in it however they agree that when they feel that a particular personalized service is useful they may switch over to new service provider with that particular personalized service and if advertised through SMS or Web, it is often used. Maximum percentages of customer disagree that SMS advertisements on mobile are useful but equal percentage of the customers agree and disagree with the items that web advertisements are useful, the personalized advertisement on mobile or web reduces the time of information seeking, advertisement on mobile help more in information seeking than advertisement on web and personalized advertisement suits and match their needs more. Maximum percentage of customers agreed that search engine on web or mobile increases searching efficiency. Maximum percentages of customers disagreed that mobile search engine are better than web search engine.

Key Words: Mobile Commerce, Personalized Mobile Services, Search Engines, SMS

1. Introduction
In today's era we know that information is knowledge and knowledge is power. We have information that is being accessed from anywhere, by anyone, at all time, by the state of mobility. Mobile phones have developed to accomplish the demands of consumers such as chatting, videoconferencing and video streaming. Mobile phones are ideally suited to wireless commerce through short message service (SMS) transmission and video calls. Mobile phones have the potential to be an ideal personalized tools. Personalization services are context - specific services to each one. Business models have already been constructed that permit service providers to locate consumers and business to create a revenue generation decision point [5.3.7]. Many companies are developing a range of engineering service packages that targets at mobile commerce (M-commerce) platforms. For example, on the software side, Qualcomm's BREW and Sun's Java 2 Micro Edition (J2ME) are two mobile application environments [5.3.4]. With the large investments, firms are eager to attract new customers and retain their old customers [5.3.2] [5.3.8]. The main drawback of M-commerce is that the screens of phones are too small as to computer screen. One screen can display limited lines of characters. User needs to use scroll up and down if more than 20 to 25 lines appear onto the mobile screen. Mobile phones offer reduced user interfaces, little client data storage and limited client business logic. Consumers will become annoyed when they read a lot of useless and general advertisements on limited mobile screen. The provision of personalized services seems to be a promising development in the information-flooding environment [5.3.3]. Personalization has been widely studied on the Web [5.2.1] [5.3.5] [5.3.6]. The objective is to create a one-to-one connection with the current consumers and providing clients with uninterrupted relevant contents [5.3.1]. With personalization, the quantity of messages sent to the customers will be reduced. The users will no longer receive abundant irrelevant messages. With smaller amount of messages, the users can view the message title, and hence select the interesting piece of information, more easily and comfortably. As a result, it is likely that personalization can solve the problem of small screen display in M-commerce. However, the question is whether personalization is an effective tool to attract more subscribers. The findings from this study will answer that question. The research will produce data from pragmatic study, which will define whether a mobile service provider can use personalized services to draw attention of subscribers to switch to any particular company. An increased number of new subscribers would

indicate client preference for personalized services from the provider. A survey study was administrated to collect data on personalization mobile services from service consumers, who were knowledgeable about personalization. This research paper is divided into 6 sections as given below:

Section 1 tells about the Mobile commerce, research objectives and review results completed to form the hypothesis. Section 2 gives the study background and states the research hypotheses. Section 3 provides the operationalization of variables and Section 4 defines the findings. Section 5 presents the interpretations. And final Conclusions shall be presented in the Section 6.

2. The study

The present study identified the factors that inspire or restrain the tendency for mobile phone users to change to a new service provider with personalized services. When assessment is made between wireless commerce and wired commerce, the main drawback in M-commerce are the limited information display area for navigation and the limited client data storage as compared to computer screen. Mobile users are generally reluctant to spend time browsing and reading broadcast messages. Also, broadcast messages are considered to be a type of interruptions. Marketing researchers have pointed out that people are inclined to feel annoyed with interruptions. Also, their working efficiency is lowered when the frequency of interruption increases [5.1.1]. Consumers generally prefer personalized services to as compared to general services. However, it has not been recognized whether personalization is the factor that motivates customers to change their service provider. Therefore, the proposed Hypothesis is as follows:

H1: When a user perceives the personalized service to be useful he will tend to switch to the service provider with personalized services.

H2: Amount and usefulness of an advertisement on a portal influences the consumer's usability for that portal.

H3: Search engine efficiency and information seeking cost influences the consumer's decision on choosing a better service provider/portal.

H4: Privacy concern in personalization discourages consumers to switch to a service provider with personalized services.

3. Variable Operationalization

3.1 Data Collection and Samples

Questionnaire was developed for personalization services in M-commerce. The questionnaire consisted of 15 questions and all the questions were measured on the scale of 4- points. The survey was made on 250 people from National Capital Region (NCR) of India, which exactly has representation or presence of people from adjoining three big states of India which make it more suitable as the true representative of the population. Random sampling was done from a list of white collar people working for companies in different sectors because these subscribers are considered to be the most suitable prospective customers for M- Commerce and are likely to choose their service provider based on criterion mentioned by researchers in the literature survey.

3.2 Measurements of Variables

1. About Constructs

Usefulness of personalized services consists of four items and the reliability of this construct is 0.87. Usefulness is defined as the degree to which a person believes that using a particular system would enhance his job performance and consumer will tend to switch to the service provider with personalized services. Amount of messages through advertisement consists of six items and the reliability of this construct is 0.95. Amount and usefulness of an advertisement on the portal influences the consumer's usability for that portal. Search engine efficiency consists of three items and the reliability of this construct is 0.94. Search engine efficiency and information seeking cost influences the consumer's decision on choosing a better service provider/portal. Privacy infringement from personalization consists of two items and the reliability of this construct is 0.88. Privacy concern in personalization discourages the consumers to switch to a service provider with personalized services.

2. About Items

Construct (factor) 'Usefulness of personalized services' is made up of four items like after seeing an advertisement of a company providing personalized E-commerce service, a customer switches over to that service provider. This item has been developed with the purpose to ask if personalization is the factor that motivates the customers to switch over to that service provider that provides personalized E-commerce service. The item When a customer feels that a particular personalized service is useful, he switches to the service provider that provides a particular personalized service has been developed with the purpose to ask if personalization services are context specific services for an individual or not and if one finds that the personalized service is useful to him whether he will switch over to service provider or not. Personalized advertisement on mobile or web reduces the time of information seeking. This item has been developed with the purpose to know if personalized advertisement on mobile or web creates one to one relationship with the customers and provides clients with an uninterrupted relevant content. This may reduce the time of information seeking for the customers. The item Personalized advertisement suits and match customers needs has been developed with the purpose to know that the users receiving numerous messages as personalized advertisement, which is an attractive tool to attract more subscribers, really suits and match their needs or not. Construct (factor) 'Amount of messages through advertisement' is made up of six items like Mobile service provider sends too many SMS many advertisements to read. Mobile service providers being eager to attract their customers sends too many SMS messages to them and increase their business without knowing whether these message are useful or not and if these messages are too many to be read by the customer. Too many pop-ups are read while checking mail through web. This item has been developed with the purpose to ask for a comparison of number of pop-ups need by the customer while checking mail on web or WAP. SMS advertisements on mobile are useful. This item has been developed with the purpose to know if the customers using mobile phone can get information anywhere, any time. The item Web advertisements are more useful than SMS advertisements has been developed with the purpose to make a comparison between the usefulness of SMS advertisement on web or WAP. New services advertised through SMS or Web is oftenly used. This item has been developed with the purpose to know if the customers really uses or not the new services, provided by the service providers through SMS or web. Advertisements on mobile help more in information seeking than advertisement on Web. This item has been developed with the purpose to ask the customers whether advertisement on mobile is more information seeking or advertisement on the computer is more information seeking. Construct (factor) 'Search engine efficiency' is made up of three items like search engine on web or mobile increases searching efficiency. This item has been developed with the purpose to ask that the customer if searching any information by using search engine on computer or mobile increases their efficiency or not. The item Mobile search engines are better than web search engine has been developed with the purpose to ask the customer, which search engine is better to access information, mobile search engine or web search engine. The item Information seeking through mobile is costlier than information seeking through web has been developed with the purpose to know if the customer feels that accessing any information through computer is costly or through mobile it is costlier.

Construct (factor) 'Privacy infringement from personalization' is made up of two items like personalized technology infringes privacy. This item has been developed with the purpose to ask if the customer feels that the service provider collecting their information infringes their privacy. The item Customer don't want his personal information collected by service providers to be used for personalization analysis has been developed with the purpose to ask if the customers get annoyed when they find that the personal information is collected by the service provider for analysis purpose.

3.3 Reliability and Validity of Construct

All independent variables are standardized and then grouped by factor analysis. Principal Components Analysis is employed for factor extraction. The independent factors are *Usefulness of personalized services (FX1), Amount of messages through advertisement (FX2), Search engine efficiency (FX3) and Privacy Infringement from Personalization (FX4).* In our survey these factors clarify 85.34% of the total variance. Items load highly (> 0.60) on their associated factors. The factors that are discussed above, have been evaluated for reliability, convergent validity and discriminant validity. The whole statistical analysis was performed with SPSS. In the reliability test, the internal consistency for each factor was accessed by computing Cronbach's alpha **(Table 1)**. Nunnally [5.4.1] suggests that a reliability value of 0.8 or above is acceptable. Hence, all factors are deemed reliable.

4. Results

Descriptive statistics on the four latent factors are depicted in **Table 2** below.

Items Scaling

FX1: Usefulness of personalized services (**Table 3**)
FX2: Amount of messages through advertisement (**Table 4**)
FX3: Search engine efficiency (**Table 5**)
FX4: Privacy Infringement from Personalization (**Table 6**)

5. Interpretation

Since all the Z_{cal} values for hypothesis H1, H2, H3 are more than Z_{tab} values hence these three hypotheses are accepted while the Z_{cal} value of H4 is less than Z_{tab} value hence hypothesis H4 is rejected. From the survey it is interpreted that if the customers perceive a personalized service is useful to them they may switch over to the service provider with better personalized services **(Mean 130)** and even they don't get influenced by the amount and usefulness of an advertisement irrespective of the fact that it is advertised on a Web or WAP **(Mean 165)** and moreover they may not choose a portal based on the usefulness of these advertisements on any of the mentioned portals but search engine efficiency and cost of information seeking definitely act as a deciding factor for a customer to chose a particular service provider/portal **(Mean 86).** Privacy infringement do not effect subscriber decision to switch to a new service provider rather than customers are more concern regarding the usefulness of personalized message than the privacy issues which may arise due to the collection of information service provider saying that it will utilize for personalized service **(Mean 62).**

6. Conclusion

Following conclusions have made from above study:

i) It is very difficult to locate a piece of useful information from too many advertisement messages and this is the reason why the maximum percentage of customer disagree to the fact that after merely seeing an advertisement of a company they may switch over to that service provider.

ii) Maximum percentage of customers agree that when they feel that a particular personalized service is useful they switch over to service provider with that particular personalized service.

iii) Maximum percentages of customer agree that mobile service provider sends them too many SMS advertisements.

iv) Almost equal percentages of customers agree and disagree with the item that when they see their E-mail, they got lot many pop-ups.

v) Maximum percentages of customers disagree that SMS advertisements on mobile are useful.

vi) Almost equal percentage of the customers agrees and disagrees with the item that web advertisements are useful.

vii) Maximum percentages of customers agree that new service advertised through SMS or Web is frequently used.

viii) Almost equal percentages of customers agree and disagree that the personalized advertisement on mobile or web reduces the time of information seeking.

ix) Equal percentages of customers agree and disagree with the item that advertisement on mobile help more in information seeking than advertisement on web.

x) Similarly, equal percentages of customers agree and disagree with the item that personalized advertisement suits and match their needs.

xi) Maximum percentages of customers agree that search engine on web or mobile increases searching efficiency.

xii) Maximum percentages of customers disagree that mobile search engine are better than web search engine.

xiii) Maximum percentages of customers agree with the item that information seeking through mobile is costlier than information seeking through web.

xiv) Maximum percentages of customers also agree that personalized technology to collect their personal data infringes their privacy.

xv) Finally maximum percentages of customers agree with the item that they don't want their personal information collected by service providers to be used for personalization analysis.

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Table 1: Reliability

Constructs	Items	Reliability
Usefulness of personalized services	4	0.85
Amount of messages through advertisement	6	0.94
Search engine efficiency	3	0.95
Privacy infringement from personalization	2	0.87

Table 2: Descriptive Statistics

	N	Mean	S.D.	S.Error	Z_{Cal}	Z_{tab}
Usefulness of personalized services	250	130	14.10	0.89	11.23	1.29
Amount of messages through advertisement	250	165	23.3	1.4	7.14	1.29
Search engine efficiency	250	86	13.4	0.847	7.08	1.29
Privacy infringement from personalization	250	62	7.9	0.49	1.03	1.29

Table 3: Scaling Results for Item 1(FX1)
FX1: (1=Strongly Disagree, 4=Strongly Agree)

	Mean	S.D.
X1	2.35	0.67
X2	2.75	0.50
X8	2.60	0.74
X10	2.45	0.70

Table 4: Scaling Results for Item 2(FX2)
FX2: (1=Strongly Disagree, 4=Strongly Agree)

	Mean	S.D.
X3	2.40	1.07
X4	2.60	0.89
X5	2.20	0.83
X6	2.40	0.83
X7	2.80	0.63
X9	2.45	0.74

Table 5: Scaling Results for Item 3 (FX3)
FX3: (1=Strongly Disagree, 4=Strongly Agree)

	Mean	S.D.
X11	2.95	0.67
X12	2.30	0.77
X13	3.05	0.59

Table 6: Scaling Results for Item 4 (FX4)
FX4: (1=Strongly Disagree, 4=Strongly Agree)

	Mean	S.D.
X14	2.9	0.54
X15	3.0	0.63