Key Drivers of Mobile Commerce
- An Exploratory Study

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Abstract

Mobile commerce is a business model that allows a consumer to complete all steps of a transaction by using a mobile phone or personal digital assistant (PDA) rather than by going to a physical store or by voice. Downloading ring tones and screensavers and using different types of paid information (traffic reports, sports news, etc.) and entertainment services (SMS chats, games, etc.) are common types of mobile commerce, but mobile commerce transactions can also include purchasing physical goods such as books to be delivered offline. The rapid evolution of B2C e-Commerce alternative interaction channels like World Wide Web, Mobile Telephony and Digital TV along with the continuously changing consumer behavioral patterns, has created a strong need for research tailored to the peculiarities and needs of the aforementioned emerging "distance shopping" channels. Stimulated by these evolutions, this paper focuses on the investigation of consumer attitudes and behaviors against mobile commerce in towards identifying the critical success factors for accelerating its usage. An online consumer survey constituting the research vehicle was employed within an exploratory research design setting. Despite the fact that some considerable differences regarding mobile commerce adoption rates and consumer behavioral patterns were observed, it was found that mobile commerce penetration in India is on its infancy. However, improving mobile devices, designing more user-friendly shopping interfaces, developing effective applications and services, along with reducing prices, influencing opinion leaders and solving security, bandwidth and coverage problems, constitute the critical success factors for accelerating mobile commerce adoption amongst youth in particular.

Keywords: *M-commerce; online survey; success factors; mobile telephony; distance shopping*

Introduction

One can claim that B2C electronic commerce (e-commerce) diffusion could have been much higher through mobile telephony, due to the higher mobile phones consumer adoption rates and corresponding diffusion. However, technology limitations (e.g., limited network bandwidth, limited screen size, etc.) along with the fact that the Web was first designed as a PC application, adequately confront such an allegation. Along the same lines, Digital TV constitutes another emerging technology, which, along with mobile telephony is continuously increasing their market share in the global B2C e-commerce market, offering to the end-customers a series of alternative patterns to conduct "distance shopping" activities. Considering the aforementioned rapid technological and business evolutions, along with the continuously changing consumer behavioral patterns, this paper focuses on the m-commerce sector. According to Internet World Statistics 2009, the number of Internet users worldwide was approximately 1.73 billion. The number of mobile phone users in 2010 will be 3 billion. By then, more than 80% of the mobile devices will have Internet users. India's population is around 1.17 billion and 72.2% of the population lives in villages. Population under poverty line is 22%. Population under 0-14, 15-64 and 65+ years are 30.8%, 64.3% and 4.9%, respectively (data compiled from various websites). Literacy rate is 61%. Working population of India is 699.9 million. At the end of 2009, the number of mobile users in India was more than 500 million.

M-commerce dynamics, therefore, create a strong need for research in this challenging and fast evolving area. To that end, this paper investigates consumer attitudes towards m-commerce services in India. An online survey focusing on the current usage and adoption of these services was conducted. The major objective of conducting this exploratory type of research was to provide an understanding of marketing phenomena and consumer behavioral patterns in the

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context of m-commerce in India. It is mainly used, therefore, to define the current situation, identify courses of actions and gain research insights towards formulating specific research hypotheses to be tested.

Consumer Behavior Research in E- And M-Commerce

Reviewing the B2C e-commerce literature, it is clear that the majority of research efforts until now have focused on the Web over the PC, rather on mobile telephony or Digital TV. However, on the threshold of the 21 century, m-commerce and Digital TV dynamics generate a series of challenging research questions towards building corresponding theoretical frameworks along with providing direct managerial implications and challenging business opportunities. To that end, it is obvious that consumer behaviour analysis must be utilised as a research tool from every modern organisation that deals with commerce (either conventional or electronic) within its strategic marketing planning (Siomkos and Vrechopoulos, 2002). Besides, B2C e-commerce either through the PC, or mobile phone, or Digital TV, has one generic but crucial objective: to satisfy consumers, build strong relationships with them based on loyalty, and enthuse them (ECR 1999). It is evident, therefore, that investigating consumer needs, wishes, preferences, attitudes, characteristics, behaviours, etc., through corresponding consumer surveys, constitutes the only reliable method towards achieving this business objective (Green et al., 2001). In addition, Kotler (2000) states, those customers constitute a basic source that provides the requirements to the organization regarding the development of marketing strategies. The fact is that online purchases (either through the PC, or mobile phone or Digital TV) constitute a fundamental change for customers and, therefore, a key task for e- and m-commerce is to find out who the actual and potential customers are (Turban et al. 1999). Along the same lines, Petrison et al. (1997) support that thorough knowledge of consumer behavior, coupled with advances in technology, enable marketers to target customers on a more personalized, customized and segmented basis. However, consumer behavior in e- and m-commerce has not yet been the subject of much research (Hoffman and Novak 1997, Elliot and Fowell 2000, Vijayasarathy and Jones 2001, Barnes 2002, Green et al. 2001). As a result, little is known about online customers characteristics and the factors influencing their purchase decision (Sieber

1999, Barnes 2002). Similarly, Kardaras and Papathanassiou (2000) support that the contribution of the e-commerce applications to customer satisfaction has not been yet adequately addressed, while "in today's market space the consumer is gaining more power as new distribution systems are driving price down, making access to both products and the information needed to compare alternatives easier" (Scultz and Baily 2000, p.50). To that end, Cole and O'Keefe (2000), Miles et al. (2000) and Vrechopoulos et al. (2000), state that consumer behavior research is moving beyond the simple application of traditional consumer behavior models towards a generation of new models, which are more relevant to the online environment. In sum, according to Vrechopoulos et al. (2001) and Barnes (2002), a key task for any kind of electronic commerce activities (i.e., either e- or m-commerce) is to identify the actual and potential customers (i.e., characteristics), to investigate how they are influenced and how they behave (i.e., attitude formulation and behavior) and to reveal what they really anticipate (i.e., needs, wishes, wants, preferences). Inspecting the aforementioned preliminary research findings, it is concluded that the need for consumer behavior research efforts in the context e-commerce through the Web, is strongly related with the need for corresponding research initiatives in the m-commerce context. To that end, the present study aims to support and accelerate the diffusion of m-commerce services, through providing some preliminary research insights regarding consumer attitudes and behaviors against m-commerce.

Research Methodology

A consumer survey was conducted towards meeting the objectives of the present study. An online questionnaire constituted the data collection instrument, while only Internet users participated in the sample. The sampling technique used was convenience sampling. According to Malhotra and Birks (2000), this sampling technique can be used in exploratory research designs like the present one. The questionnaire was launched on to the Internet at the end of November and the survey lasted for one month. The sample comprised of significant data (400) from different locations in India and different professional backgrounds.

The market research methodology included the following steps (Churchill, 1999):

- Development of the questionnaire.
- Installation of the questionnaire into an online format and pre-testing for identification of possible problems in clarity, comprehensiveness, accuracy and functionality, before it was given out to the sample.
- Informing the target group about the survey via the Internet and other means.
- Execution of the survey and collection of answers in a database
- Extraction of the data and statistical analysis.

Finally, it should be noted that effort was placed to invite the largest possible number of online users to complete the questionnaire. For this purpose, Internet communities and physical communities were used.

Analysis of Results and Discussion

The majority of respondents aged between 17-40 years old (73%), while females constituted the 48% of the samples. As far as the educational level is concerned, most of the respondents (85%) were highly educated (hold university and master degrees). Finally 65% of respondents live in big towns. Almost all Internet users participated in the survey own a mobile phone (90%). However, the majority of respondents that do not use mobile phones stated that the main reason for not doing that is that they "do not need it" (58%), while the second most important reason for not using such kind of devices was because "it is too expensive" (25%). However, as the penetration of mobile phones was found to be very high in all the investigated cities (at least, as far as Internet users is concerned), the aforementioned percentages were actually derived from a small set of observations and, therefore, should be interpreted with caution.

Furthermore, regarding the type of mobile contract (i.e., subscription vs. prepaid), 98% of users prefer the subscription alternative. As far as the purpose of mobile use is concerned 40% reported that they use their mobile devices exclusively for private purposes. Mobile telephony penetration seems to be higher in metro cities, as 32% of the respondents reported that they have experience with mobile devices from 4 to 6 years. On the other hand, regarding the age of the mobile device, it was found that most of users (42%) own a less than a half-year old device. Along the same lines, most of the respondents reported that they would buy a new mobile device only when "their old phone becomes useless". On the contrary, the least important

criterion for buying a new mobile device for all the respondents under study refers to the better games and sounds offered (1%). Finally, the majority of the respondents (84%) reported that their average daily calling time fluctuates between 0 to 15 minutes, while almost all respondents spend an average of 1000 -1500 INR as their monthly mobile phone expenditure (91%).

Selection Criteria for Mobile Operator

Investigating the criteria that customers use in order to select a mobile operator, some interesting differences amongst the respondents under study are observed (Table 1). More specifically, "low pricing" and "good coverage" were found to be the most important criteria for selecting providers. In other words, they usually select the same provider that "the people they talk on the phone have selected". Finally, "special offers to new subscribers" was also found to be an important criterion by all under Study.

Table 1: Mobile Operator Selection Criteria

Criteria	Percentage Response
Low pricing scheme	23.6
Special offers for new subscribers	7.5
Good coverage	20.3
The phone provided was bundled with the contract	12.5
Reputation	8.6
The people I talk on the phone have chosen the same provider	14.1
Company telephone	2.7
Good Customer Service	6.4
Other	4.3

Mobile Commerce Services Evaluation

"Information and news retrieval" (13.4%) and "e-mail" (2.3%) were found to be the most frequently used mobile services (Table 2). Another the most frequently used mobile service is "banking and financial services" (7.4%), while "Entertainment" was evaluated as the third one (4.5%). Finally, it is clear that the least used mobile service in all the Responses is "shopping". In sum, the majority of respondents (41%) do not use their mobile devices for any of the asked services. This particular finding indicates that the market is not so mature in terms of m-commerce diffusion and adoption. It should be noted, however,

that the majority of respondents stated that, "if it was possible to buy and pay for cinema tickets with their mobile phone, they would use the service, even if they had never used it before" (40%). This finding, undoubtedly, indicates the high potential of m-commerce in India.

Table 2: Mobile Services Used

Services Used	Percentage Response
Banking and financial services	7.4
Shopping	0.8
Entertainment	4.5
Information and News	13.4
Travel booking	1.6
Ticket reservation	1.8
E-mail	25.3
Other	3.9
None	41.2

Table 3: Desired/Recommended Mobile Services

Recommended Services	Percentage Response
Banking and financial services	10.9
Shopping	1.8
Entertainment	7.2
Information and News	19.7
Travel booking	3.6
Ticket reservation	2.9
E-mail	36
Other	3.9
None	18.1

Table 4: Critical Success Factors for Mobile Commerce Diffusion

CRITERIA/ ATTRIBUTES	Very important	Important	Neutral	Unimportant	Completely unimportant
Reasons for Using Mobile Services					
Good price/service ratio	69	26	3	2	0
Comfort	54	36	6	4	0
Independence of time and space	48	42	6	2	1
Curiosity	1	9	24	28	38
Personalization	10	42	26	19	4
Better Information	18	50	11	5	3
Fun	9	25	28	21	18
It helped in business	25	41	11	9	5
Recognition among my peers	5	3	23	17	52
Reasons for not Using Mobile Services					
Complicated to use	37	42	11	7	3
Lack Of security	53	29	8	6	4
Poor quality of service	56	35	5	3	1
High price for mobile access	61	28	6	2	2
Not personalized enough	12	41	28	14	6
Inconvenience of device	30	49	11	7	3
Recommendations towards Improving Mobile Services					
Improved ease of use	30	39	12	12	7
Improved security	39	30	13	10	8
Improved support	19	37	22	15	7
Lower Price	61	22	8	5	3
Improved comfort of device	34	34	15	11	6

Note: Numbers refer to percentages (%)

Regarding users' recommended and most desired mobile services (Table 3), "e-mail" was found to be the most desired service. It should be noted, however, that 18% of respondents stated that they would not be interested to use any of the asked services. It is obvious therefore that the diffusion and consumer adoption of m-commerce is much lower and there is high need to analyze the critical factors for such consumer behavior.

Success Factors for Mobile Commerce Diffusion

It is clear, that the critical success factors for m-commerce diffusion are directly related to the reasons that consumers use or not use mobile services along with their corresponding recommendations towards the improvement of such kind of services. To that end, it was attempted to provide an integrated approach by combing the results of the respondents under study, towards providing integrated managerial implications for the Indian m-commerce market (Table 4). Therefore, it was found that the most important reason for utilizing mobile services is the "good price/service ratio" (68%), while "comfort" (55%) and "independence of time and space" (48%), were found to be the second and the third most important reasons, respectively, for using such kind of services. On the contrary, the most important reason for not using mobile services was found to be the "high price of mobile access" (61%), while the second and third most important reasons for not using such kind of services were found to be "poor quality of service" (56%) and the "luck of security" (53%).

Finally, respondents were asked to evaluate the importance of a list of actions that should be taken by mobile operators towards the improvement of mobile services offered. The majority of respondents (61%) reported that "lower prices" is very important, while 39% of respondents evaluated as very important the "improved security" dimension. Finally, 34% of respondents evaluated the "improved comfort of device" as the third most important dimension.

Research Insights and Implications

Inspecting the results in Table 4, it is resulted that business must reduce prices of mobile access and improve the quality of the provided services and customer support. On the other hand, it is obvious that effort should be placed on designing more convenient mobile devices (e.g., large screens), as well as on designing more user friendly and easy to use shopping interfaces and applications. Along the same lines, security and bandwidth problems should be solved and this kind of "solution" should be communicated through specific promotional campaigns to the current and potential users. Finally, emphasis should be placed on coverage strategy, as it proved to constitute a major mobile operator selection criterion. Applying the diffusion of innovation theory (Schiffman and Kanuk 2000, Ram and Jung 1994) in the case of the present study, it is clear that mobile phone users that have already used m-commerce services are called "innovators". According to Brown (1992), innovators are those consumers who first adopt a new product or an innovation. They are few in number (the percentages included in Tables 1-4 indicate that) and are eager to try new ideas and products, are well educated and can afford any financial risk involved in adoption.

However, the consumers in a market adopt the same innovation at different times. The next group of consumers that adopt an innovation, therefore, is called "early adopters". Mobile operators should be alerted, as consumers belonging in this particular group are more socially integrated in their local communities than innovators, and are more likely to be opinion leaders. They frequently get in contact with salespeople of new products and play a crucial role as opinion leaders who influence other consumers (Rogers, 1983).

A Mobile Commerce Research Framework

This survey indicates that business strategies (e.g., price reductions, customer service improvement, etc.) and technological outcomes (e.g., mobile devices improvement, security problems solving, etc.) constitute some critical issues that should be confronted in order to increase the use of m-commerce services in India. To that end, the present study supports future research in this area, by providing an m-commerce research framework including the critical business and technology factors that should be further investigated (Figure 1). More specifically as clearly shown in Figure 2, the critical success factors for m-commerce diffusion constitute the research outcome of the exploratory type of study conducted herein. The interaction between business and technology factors implies the need for multi disciplinary research initiatives, towards enhancing the ultimate offering.
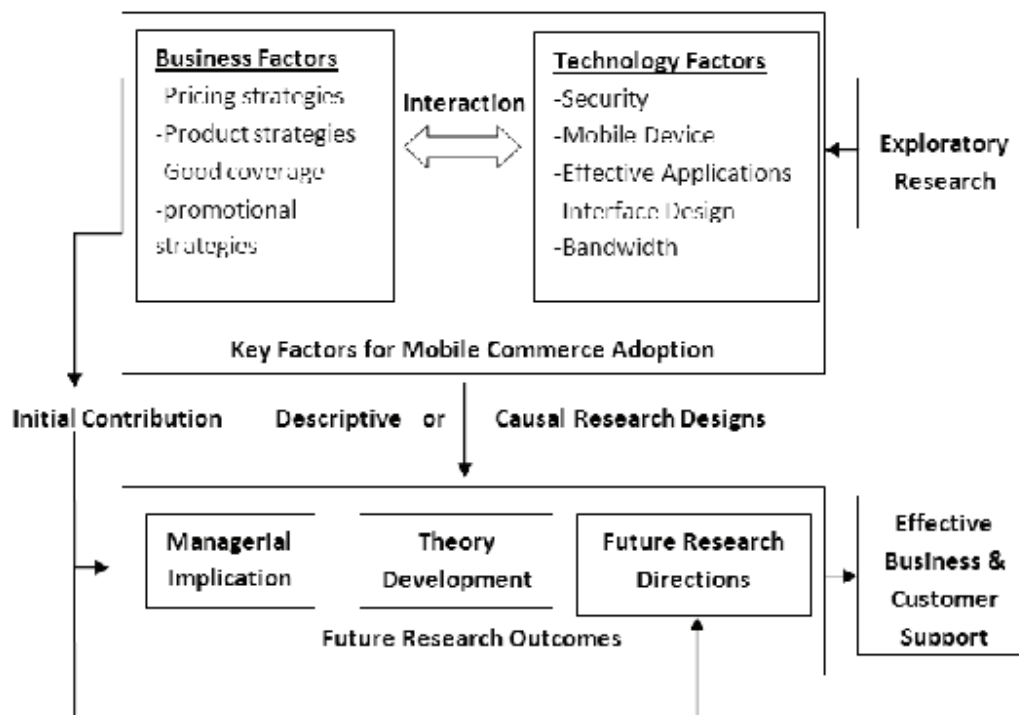
Figure 1: Mobile Commerce Research Framework

Conclusive research designs can elaborate on the provided key factors, towards providing concrete theoretical insights, direct managerial implications and challenging future research directions. To that end, business on one hand will be effectively supported by the corresponding theoretical guidelines and implications, while customers will be able to enjoy high quality of services and support. The contribution of the present study, therefore, could be summarized on one hand on the development of the "m-commerce key success factors" framework, which can be effectively utilized towards supporting and guiding future research initiatives and on the other, on the provision of some direct managerial implications and specific future research perspectives.

Managerial Implications

The findings of the present study can be utilized within the "market opportunity analysis" part included in the "situation analysis" section of an e-marketing plan (Strauss and Frost 2001, Siomkos and Vrechopoulos 2002). However, in order to set specific m-commerce business objectives and develop corresponding marketing mix strategies and action plans to satisfy these objectives, further research is needed (e.g., SWOT, Supply Side analysis, etc.). Nevertheless, elaborating on the present study findings, a generic m-

commerce strategy towards meeting the objective of accelerating m-commerce adoption rates can be proposed (it should be noted that marketing objectives should be measurable; e.g., increase m-commerce consumer adoption rates from 5% to 25%). This is the "penetration pricing strategy". Applying this pricing strategy in the m-commerce industry seems to constitute a challenging business opportunity. It refers to charging a low price for a product or service for the purpose of accelerating its use and correspondingly increase market share. Besides, this pricing strategy is very effective in price-sensitive markets It should be reminded, that respondents evaluated "high price" as the most important reason for not using m-commerce services. Furthermore, it is also concluded that investing on technological issues (e.g., mobile devices, security, shopping interface design, applications, bandwidth, etc.) constitutes another primary area of opportunity towards improving m-commerce services and satisfying customers. All these imply the effective manipulation of the "product" (e.g., devices) and the "promotion" (e.g., communicate security improvement issues) elements of the marketing mix, along with the effective manipulation of the "price" element, as discussed above. Finally, "good coverage" is directly related with the "place" element of the marketing mix and it should be also

taken into account as it was found to be a very important mobile operator selection criterion.

Limitations of The Study

A basic limitation of the present study refers to the sample size and its representativeness. More specifically, this survey will not be representative with respect to the overall population due to the fact that only Internet users were addressed, while participants were self-selecting. However, running online consumer surveys through the Internet constitutes a common research practice today (e.g., Chae et al. 2002). Furthermore as far as the second limitation is concerned (i.e., self-selection), Strauss and Frost (2001), state that the major disadvantage of online consumer surveys through the Internet is the inability to built statistically reliable samples. On the contrary, however, according to Palmquist and Stueve (1996), self-selection could be an advantage to a survey, in the sense that respondents tend to have a higher interest in certain products and services, like mobile phones and m-commerce in the case of the present study. Furthermore, another limitation of this research is that is does not use any robust statistical test (e.g., ANOVA, t-Test, etc.) towards providing enhanced and more reliable results.

However, as explained previously, this research constitutes an exploratory type of research, implying that emphasis was placed on understanding marketing phenomena towards formulating and guiding future research along with providing some generic managerial implications, rather than providing robust statistical results.

Conclusions and Future Research Perspectives

The penetration of m-commerce, vary between different locations and markets in India. In addition, there were considerable differences observed regarding consumer behavioral patterns, adoption rates and attitudes towards m-commerce. However, except "e-mail" and "information and news retrieval", all the other mobile services (e.g., shopping, travel booking, etc.), are not widely utilized. Nevertheless, it should not be ignored that 7.4%,4.5% of users have already used their mobile phones for online banking/financing and entertainment services, respectively. In general, however, it is clear that m-commerce is in its early stage in India. To that end, the present study provided an initial understanding of consumer attitudes and behaviors against m-

commerce along with revealing the critical success factors for business effectiveness in this particular industry. The need for continuous research in this fast evolving area is apparent. Future research can elaborate on the present study findings towards developing and testing corresponding research hypotheses within conclusive research designs (i.e., through descriptive or causal research approaches). For example, a potential hypothesis may investigate and test whether there are significant differences (e.g., through the use of a t-test) between "Internet shoppers" and "Internet users" (i.e., non shoppers) regarding mobile services evaluation criteria. Such a research can effectively support marketing programs tailored to specific customer needs, characteristics and behaviors. Another challenging future research direction is to develop the profile of "early adopters" (i.e., the group of customers that act as opinion leaders) through corresponding consumer surveys, enabling through that mobile operators to effectively target and "influence" this critical customer segment. Finally, a futuristic but promising research approach, can elaborate on the "future alternative B2C e-commerce evolutions scenarios" by inspecting whether there are significant differences between the three alternative "distance shopping" channels, as far as consumer attitudes are concerned. To that end, a robust statistical test like ANOVA is proposed, while "ease of use" and "perceived usefulness" (TAM constructs; Davis 1989) can play the role of some of the dependent variables measured within a descriptive or causal research design.

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