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CUSTOMER PERCEPTION ON IMPACT OF MOBILE COMMERCE

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ABSTRACT
The research is descriptive in nature and the area of study chosen is Chennai city. In order to validate the questionnaire, a pilot study was conducted among respondents representing three geographic regions of Chennai among various age group and professions. The purposive sampling technique is used to collect the required data. After these two stages, the random sampling method is applied to obtain various demographic and occupational data. The data was collected through a well structured questionnaire with 102 variables. The following statistical tools were used in the study to deduce the results about data variables: t - test and Paired t test, Factor Analysis, Karl Pearson‟s Co-efficient of Correlation, ANOVA. Descriptive and inferential analysis was done using SPSS and AMOS. Descriptive statistics reveals that, 54% of the respondents are using pre-paid connection and 46% of the respondents are using postpaid connection. Half of the respondents‟ network provider is Airtel 52% in Chennai. The respondents consider the speed as important for using mobile commerce applications. It is found that, “there is a significant association between income and the type of connection”, “the money spent on mobile usage with the income”, “the network provider and reliability of network” and “educational qualification with comfortable use of mobile for internet”. Findings also confirm that there is lot of scope for mobile commerce services in India. Mobile commerce is complex in nature and includes procedure in market and is in infancy stage in India. For successful implementation of mobile device application it is necessary to build awareness among the customers by embracing the technology and promoting it indigenously.

Key words: Airtel, network provider, reliability of network, mobile device, Chennai.

Introduction
Mobile Commerce was first introduced in 1997, at the launch of the Global Mobile Commerce Forum by Kevin Duffey. Mobile Commerce has gained increasing acceptance amongst various sections of the society in previous years. The reasons for its growth can be attributed to technological and demographical developments that have influenced many aspects of the socio-cultural behaviour in today‟s world. The growth of mobile commerce applications is remarkable and more consumers are transferring to mobile commerce to achieve better and fast transaction in India. Worldwide market for mobile commerce in the year 2018 is expected to be $800 billion. In US, 2015, over 950 million people accessed shopping websites via mobile apps alone. By 2017,

the total number of apps to be downloaded worldwide might reach to 270 million leading to a revenue of approximately $42 billion.

After the advent of mobile technology, the mobile penetration is expected to reach 1145 million in the year 2020, with 45% share of smart phones. Introduction of low cost smart phones, high speed internet services and free internet services is encouraging a large Indian population to adopt mobile commerce. Customer perception is a challenge for telecommunication companies. In the last few years, the mobile telecom market has witnessed a substantial growth and rapid changes globally, as well as in India. Customer satisfaction is a critical issue in the success of any business system. Many studies focused on usage of mobile commerce, but many problems faced in adoption of mobile device use were not studied in detail. There is no serious in-depth research carried out about the impact of mobile commerce in Chennai city. The main aim of this research is to validate the concepts of customer perception on impact of mobile commerce adoption and to ascertain the influence of demographic variables among the awareness, practice and adoption of mobile commerce services, changing customer attitude and the problems faced by the mobile device users.

Mobile Commerce

The concept of mobile commerce can be defined in various ways. Mobile Commerce is a mixture of information and communication technology, mobile technology and internet. The following section provides the gist of what mobile commerce is all about.

Ovum defines mobile commerce as, "The core of mobile E-commerce is the use of a terminal (telephone, PDA, PC device, or custom terminal) and public mobile network (necessary but not sufficient) to access information and conduct transactions that result in the transfer of value in exchange for information, services or goods".

J.P. Morgan defines Mobile Commerce as "Business-to-consumer transactions conducted from a mobile device". Mobile commerce is "E-Commerce over mobile devices", as per Robinson-Humphreys. According to Forrester, “The use of mobile handheld devices to communicate, interact via an always-on high- speed connection to the Internet” is Mobile Commerce.

Mobilocity defines Mobile commerce as, "The use of wireless technologies to provide convenient, personalized and location-based services to your customers, employees and partners". Mobileinfo.com explains, “Any electronic transaction or information interaction conducted using a mobile device and mobile networks that lead to the transfer of real or perceived value in exchange for information, services or goods”, as Mobile Commerce.

Mobile commerce adopted today are hotel booking and reservation, purchasing airline tickets, purchasing movie tickets and restaurant booking and reservation, online shopping through Amazon, Flipkart, Big basket and the list goes on. Booking of the cab through Ola and Uber is prevalent and well appreciated by all in India.

Lehman (1995) defines Mobile commerce as "the use of mobile hand- held devices to communicate, inform, transact and entertain using text and data via a connection to public and private networks”. Durlacher research‟s definition is, “Any transaction with a monetary value that is conducted via a mobile tele- communication network”. Mobile commerce contributes the

potential to deliver most of what the internet can offer, plus the advantage of mobility. Mobile commerce gives mobile communication devices like mobile phones and personal digital assistants (PDA) the ability to pay for goods and services.

According to Vitter-Pillippe and Navarro (2000), as the mobile commerce industry is still in its infancy, there are many unsolved problems related to its services. One major issue is the development of service that can support different types of mobile devices and multiple networks, and provide foolproof security to customers. Software and interface vary among different suppliers and service providers. Many industry and technology leaders are addressing these problems and thus Mobile commerce has a great potential.

Shuster (2001) defines Mobile commerce, "the use of the wireless device to communicate, interact, and transact via a high-speed communication to the internet". Angsana (2002) emphasizes on three elements of Mobile commerce – a range of activities, devices, and network types and defines Mobile commerce as, "all electronic transactions (e.g., communication interaction, purchase, payment) that use a data-enabled wireless device connected to the internet or a vendor's private network".

Mobile commerce refers to any business with a definite monetary value performed over the mobile phone. The Information technology and telecommunication have jointly given the by-product, i.e. Mobile commerce which is an extension of e-commerce through wireless mediums. This convergence of two technologies provides and enables some services which may not be possible through e-commerce. Mobile commerce is a natural successor of e-commerce, Mahil (2008). Mobile commerce should not be viewed as e-commerce with limitations, but rather as a unique form of e-commerce with its unique benefits according to Scornavacca et al., (2006).

According to Muhib Ullah et al., (2012), Mobile Commerce is an emerging business paradigm in which the buying and selling of products and services are done through mobile equipment. These equipment are mobile phones, personal digital assistant (PDA) or other hand held wireless devices. Mobile commerce vendor organizations face many challenges regarding customer relationships management.

According to Siau et al., (2001), "Mobile commerce is all about delivering the right information to the right place at the right time", meaning that they are ubiquitous and purposeful tools reshaping the landscape of commerce. According to Rajaraman (2005), the definition of e-commerce is, "the sharing of business information, maintaining business relationships and conducting business transactions using computers interconnected by a telecommunication system".

M-Commerce Vs E-Commerce

The concept of Mobile commerce is represented as a "subset of all e- commerce" made available from a wireless device.

According to Lee et al., (2004), the advent of wireless and mobile technology as a subset of E-commerce has created both new opportunities and new challenges for the business community. The emergence of wireless and mobile networks has made possible the admission of

e-commerce as a new application and research subject in the area of Mobile commerce, which is defined as the exchange or buying and selling of commodities, services, or information on the Internet through the use of mobile handheld devices. Mobile commerce has come forward to become the new trend in business transactions. With the inherent advantage of anytime, anywhere and the on the go, the flexibility and convenience of mobile commerce are superior to Electronic Commerce in the customer‟s perception.

Research Methodology of the Study

Research methodology adopted for this study is explained in terms of Research Design, Sources of Data, Sampling Design, Selection of Sampling Area, Sampling Technique and Sample size calculation as given below.

Analysis of Data

The data collected from both the sources were scrutinised, edited and tabulated. The data collected from 720 respondents have been explored in this study. Kaiser-Meyer-Olkin Measure of Sampling Adequacy value is 0.884. This suggests that the sample size is adequate to conduct factor analysis. The Bartlett‟s Test of Sphericity value is also significant.

Further, the processed data were analysed using statistical package for social sciences (IBM SPSS 20). The following statistical tools were used in the study to deduce the results about data variables:

- t-test was applied to ascertain the nature of responses about the causes of and its impacts
- Factor Analysis has been used to identify the factors of causes
- Karl Pearson‟s Co-efficient of Correlation was computed to explore the parametric relationship among the various factors of and consequences
- One way Analysis of Variance (ANOVA) has been used to ascertain the significant relationship between

A model was developed using Analysis of Moment Structure (AMOS). This model includes Ease of use, Security, Purpose, Bottlenecks, Financial aspects, and Benefits (Perception Impact). These factors are taken as observed variables (variables measured are confirmed as factors).

Structural Equation Model (SEM)

Structural equation modelling (SEM) is a multivariate statistical analysis technique that is used to analyze structural relationships between measured variables and latent constructs. This technique is the combination of factor analysis and multiple regression analysis illustrating a set of relationships providing consistency and comprehensive explanations of the actual phenomena. This method is preferred for the research because it estimates the multiple and interrelated dependence in a single analysis.

Statistical Tools used

Percentage Analysis

A percentage is a number or ratio expressed as a fraction of 100. It explains the portion of the population satisfying a particular criterion. The representative share of the sub sets within the demographic variable such as Gender, Age, Qualification, Occupation, Income are analysed using percentage analysis.

Mean

Mean refer to a central value of a discrete set of numbers for a data set. It refers to measure of the central tendency variable characterised by that distribution.

Standard Deviation

Standard deviation (SD) is a measure that is used to quantify the amount of variation or dispersion of a set of data values. A low standard deviation indicates that the data points tend to be close to the mean of the set. The standard deviation is used to measure confidence in statistical conclusions. Consistency of various responses for the attributes like level of awareness, Utilisation, Attitude, level of satisfaction etc., is analysed using SD.

Chi-square test

Pearson's Chi-squared test ($\chi 2$) is a statistical test applied to sets of categorical data to evaluate how likely it is that any observed difference between the sets arose by chance. It tests a null hypothesis stating that the frequency distribution of certain events observed in a sample is consistent with a particular theoretical distribution. Pearson's Chi-squared test is used to assess three types of comparison: goodness of fit, homogeneity, and independence.

To test the relationship between type of connection and income, income and money spent, network provider and reliability, Qualification and access, Distance of Bank and mobile transactions, Chi-square test is used.

ANOVA

Analysis of variance (ANOVA) is a collection of statistical models used to analyze the differences among group mean. It provides a statistical test of whether or not the means of several groups are equal and therefore generalizes the t- test to more than two groups.

Independent Sample‘t’ test

The Independent Samples t-Test compares the means of two independent groups to determine whether there is statistical evidence that the associated population means are significantly different.

Factor Analysis

Factor analysis is a statistical method used to describe variability among observed, correlated variables regarding a potentially lower number of unobserved variables called factors. It deals with data sets where there are large numbers of observed variables that are thought to reflect a smaller number of underlying/latent variables.

Correlation Analysis

Pearson correlation coefficient of correlation depicts extent to which two variables have a linear statistical relationship with each other.

Regression Analysis

Regression analysis estimates how the value of a dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed. Regression analysis is used for prediction and forecasting.

DATA ANALYSIS AND INTERPRETATION

The well framed questionnaire is used to elicit the required data regarding customer perception on the impact of mobile commerce. The collected data were analyzed and interpreted for

understanding the impact of mobile commerce. The analysis is carried by using descriptive statistics and inferential statistics.

a) Descriptive statistics (Elaine Lawrence et al., 2004) are brief descriptive coefficients that summarise a given data set, which can be the representation of the entire population. Descriptive statistics are broken down into measures of central tendency and measures of variability or spread. This study is used to find out the agreement the factors included regarding examining the adoption of mobile commerce. This includes a demographic profile of the respondents, level of awareness of mobile commerce, usage of mobile commerce services, responses regarding factors influencing mobile commerce services, and problems of using Mobile commerce application.

b) Inferential analysis (Liyi Zhang et al., 2012) makes inferences about the population based on a sample of data. It helps to identify the impact of independent variables on the dependent variables.

Table:1. Construct and Variables

Construct	Variables
Security	S1 I am satisfied with the ability of merchants to prevent security threats. S2 I am satisfied with the way the merchants protect my information while in transaction. S3 I believe that the security system will confirm identity before disclosing account information. S4 I believe that the security system will confirm my identity before processing transactions. S5 I believe that the security system provides a secure environment in which to bank. S6 I believe my transaction information will only reach the target bank account. S7 I believe that the security system does not allow unauthorized access to the account.
Easy to use	E1 I find the mobile commerce is easy to use. E2 I think that using mobile commerce service is beneficial to me. E3 I trust the ability of mobile commerce to protect my privacy. E4 Mobile commerce is flexible for 24 hours/day business E5 Mobile commerce helps me to know the state of my account faster. E6 Mobile commerce is compatible with my banking needs
	B1 Mobile commerce sites provide inadequate information and lack B2 Mobile commerce has the chance of data loss. B3 Mobile commerce needs expertise and training

Bottlenecks	B4 Mobile commerce will allow the third person to access personal information. B5 I Will not trust Wireless communications until I have clear evidence that it can be trusted B6 I think Mobile commerce has the chance of fraud.
Purpose	P1 I feel that user-friendliness of the mobile commerce website is important P2 I will frequently use mobile commerce in the future P3 Mobile commerce gives the joy of controlling my financial transactions. P4 Mobile commerce has more flexible ways to search for information. P5 People important to me think that i should use mobile commerce facilities P6 I think Mobile commerce is convenient
Financials	F1 Mobile commerce makes it easier for me to do my banking. F2 Mobile commerce transactions save more time. F3 Mobile commerce has Fewer risks (than carrying cash in hand) F4 I feel Mobile commerce save transport cost F5 I think Mobile commerce transactions are faster
Perception impact benefits	Be1 Transaction through Mobile commerce is cheaper Be2 I think Mobile commerce enhance my ability to save and Earn interest Be3 I think Mobile commerce cost is low Be4 I think Mobile commerce transaction is more secure

Model specification:

Several factors influence the perception of the impact of mobile commerce for the customers namely security, ease of use, bottleneck and purpose. High levels of satisfaction of these factors can only result in customer indulging in the financial transaction through mobile commerce. Only upon experiencing financial transaction personally, a perception can be formed about the impact of mobile commerce. The following hypothesis is formulated using the above factors.

Model fit is good for customer perception impact on mobile commerce

Null Hypothesis (H0): The model fit is good for customer perception impact on mobile commerce.

Alternate Hypothesis (H1): The model fit is not good for customer perception impact on mobile commerce.

H17 There is no impact of exogenous construct security on endogenous construct financial.

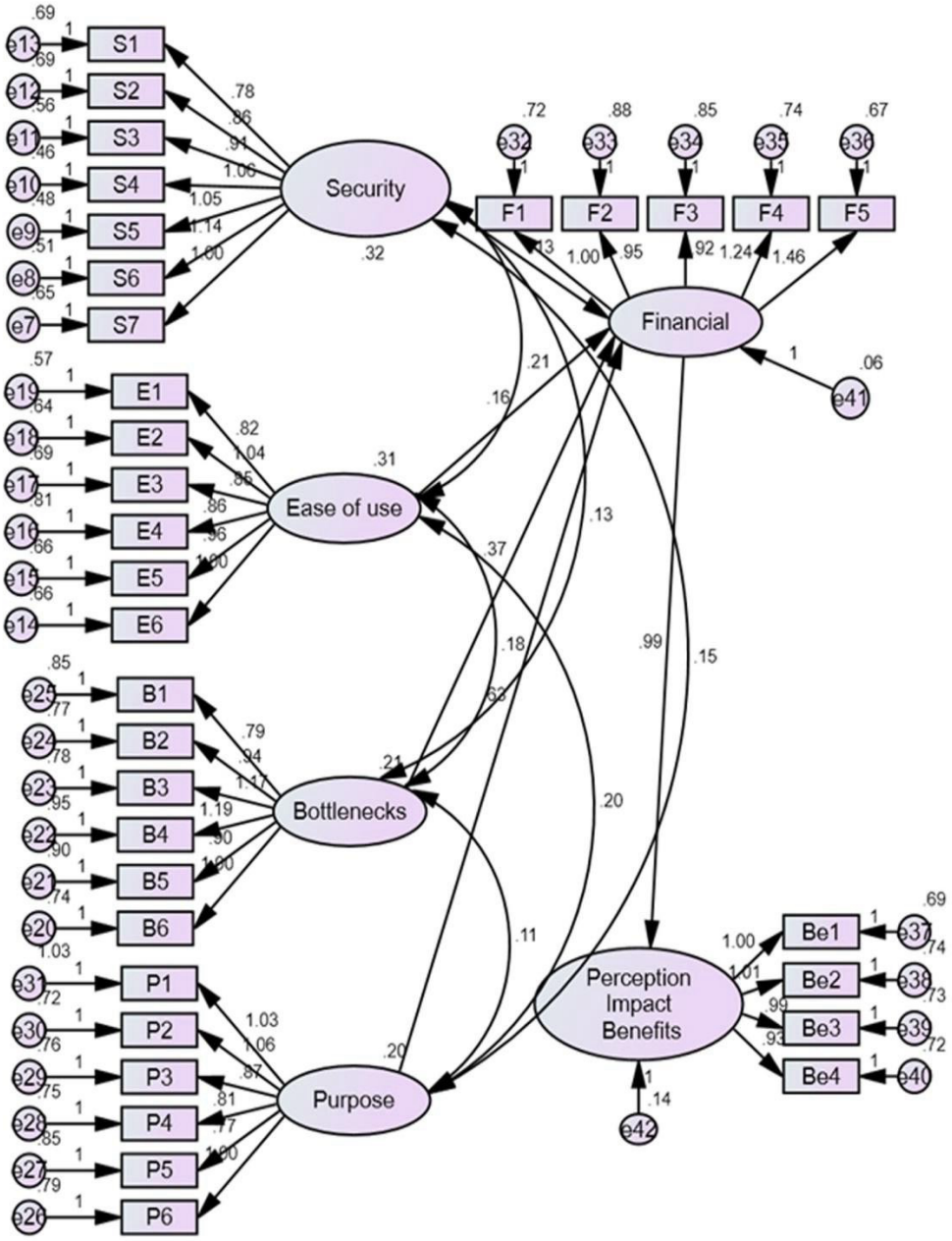
H18 There is no impact of exogenous construct easy of use on endogenous construct financial.

H19 There is no impact of exogenous construct Bottleneck on endogenous construct financial.

H20 There is no impact of exogenous construct Purpose on endogenous construct financial.
H21 There is no impact of endogenous construct Financial aspects on endogenous.

The following diagram is constructed using AMOS 20.0 to test the relationship between the independent and dependent constructs (Factors) using the above hypotheses.

Figure No. 1
Customer Perception Impact on Mobile Commerce



Source: Primary Data

From the diagram financial and perception, impact benefits are considered to be an endogenous factor. Security, easy of use, bottlenecks and purpose are considered to be exogenous constructs. Direct and indirect relationship of financial with the above exogenous factors and thereby with the perception impact is found out as follows.

Model Evaluation

The model fit indices are estimated using AMOS 20.0 and represented in Table 1.

TABLE No. 2 Structural Equation Model

Variable	Value	Recommended reference values
χ^2/df	2.97	χ^2/df = <5
Goodness of Fit Index (GFI)	0.955	> 0.90
Adjusted Goodness of Fit Index (AGFI)	0.907	> 0.90 / 0.80
Comparative Fit Index (CFI)	0.918	> 0.9
Normed Fit Index	0.930	> 0.90
Relative Fit Index	0.904	>0.90
Incremental Fit Index	0.908	> 0.90
Root mean Square error of Approximation(RMSEA)	0.049	< 0.05
Root mean Square (RMR)	0.032	< 0.05

Source: Primary Data

Interpretation

The model fit Chi-Square value is 11.88, its degree of freedom is 4, χ2/df is 2.97 and the model‟s p-value is 0.112 which is not significant at 5% level of significance, therefore null hypothesis is accepted (i.e.) “The model fit is good for customer perception impact on mobile commerce". The value of the comparative fit index, normed fit index, relative fit index, incremental fit index are more than 0.9. The value of Goodness of Fit Index is 0.955 and the value of Adjusted Goodness of Fit Index is 0.907, both are more than 0.9, it shows that the model is reasonably good. The RMSEA value is less than 0.05 to prove it to be a good model. The above table shows that the Root Mean Square Error of Approximation is 0.049 and the Root Mean Square (RMR) is 0.037, which are less than 0.05 smaller value indicates the model is good. Thus the model developed using AMOS for customer perception impact on mobile commerce is good.

Table: 3. Path coefficient are estimated

Factors	Coefficient	p-Value	Result
Financial Security (F5 F1)	0.13	0.045	Significant *
Financial Easy of use (F5 F2)	0.21	***	Significant **
Financial Bottleneck (F5 F3)	0.37	***	Significant **
Financial Purpose(F5 F4)	0.18	***	Significant **
Perception Impact Financial (F6 F5)	0.99	***	Significant **

The exogenous construct F1 is measured by seven indicators S1 to S7 which are significant at α% level. The coefficient of factor F1 on factor F5 is 0.13 and the p value is 0.45, is less than the reference value 0.05 which is signified at 5% level.

The exogenous construct F2 is measured by six indicators E1 to E6 which are significant at α% level. The coefficient of factor F2 on factor F5 is 0.21 and the p-value is 0.000*** is less than the reference value 0.05 which is signified at 1% level.

The exogenous construct F3 is measured by six indicators B1 to B6 which are significant at α% level. The coefficient of factor F3 on factor F5 is 0.37 and the p value is 0.000*** is less than the reference value 0.05 which is signified at 1% level.

The exogenous construct F4 is measured by six indicators P1 to P6 which are significant at α% level. The coefficient of factor F4 on factor F5 is 0.18 and the p value is 0.000*** is less than the reference value 0.05 which is signified at 1% level.

The exogenous construct F5 is measured by six indicators F1 to F6 which are significant at α% level. The coefficient of factor F5 on factor F6 is 0.99, and the p value is 0.000*** is less than the reference value 0.05 which is signified at 1% level.

Summary

In this model, five factors have been used to bring out the relationship among them. Two dependent constructs and four independent constructs (exogenous) are considered.

The variables security (F1), ease of use (F2), bottlenecks (F3), Purpose (F4) influencing financial aspects (F5) and consequently influencing Perception Impact (F6). Out of 4 constructs, the coefficient value of bottlenecks (F3) is 0.37, which is influencing financial aspects (F5) more than the other constructs. The second leading contributing factor is eases of use (F2) whose coefficient value is 0.21. The factors Security (F1) and Purpose (F4) are almost equally contributing to financial aspects (F5), the coefficient value of Security (F1) is 0.13 and coefficient value of Purpose (F4) is 0.18 are almost similar. The coefficient value of financial aspects (F5) on

Perception Impact (F6) is 0.99 which shows financial aspects (F5) highly influence Perception Impact (F6).

Conclusions

Mobile commerce has attracted the attention of both practitioners and academics. In particular, research activities on mobile commerce have increased significantly after 2000. The transition from traditional model of commerce to e- commerce and now to mobile commerce was led by the retail segment. Industry sources indicate that digital commerce accounts for a fraction of the total sales of retail industry. This indicates there is a huge potential for mobile commerce, which is yet to fully explore the segments, especially finance, health, entertainment and on-demand services. Mobile commerce is the future trend as technology continues to progress and new systems are being created, mobile commerce is on a rapid rise. Today more people are constantly on the go and the ability to conduct businesses in the palm of your hand wherever you go is definitely on higher demand. There has not been much research on the relationship between culture and mobile commerce. There is no doubt that mobile commerce will burgeon in the future.

It is important to highlight that this research was conducted with the resources accessible within the time frame provided for a detailed assessment of the customer perception on impact of Mobile commerce in Chennai. Mobile application and mobile commerce continue to expand. Over one billion people use smartphones to go online every day and mobile shopping is trending as never before. Success will rely on honing efforts to address customer centric experiences, narrowing the focus to the most valuable programs and selecting the right technology strategy that will enable service providers internal teams to deliver optimized experiences scalable.

REFERENCES

Angsana, A. T. Diffusion of -Commerce: A Coupled-hazard approach , University of Minnesota for the Department of Information and Decision Sciences, Carlson School of Management, 2002.

Elasmar, M. and Carter, E.,-mail by College Students and Implications for Curriculum , Journalism and Mass Communication Educator, Vol. 51, No.2, pp. 46 -54, 1996.

Lehman Brothers.1995. Moving in Mobile media mode.

Lembke and Johan,Commerce and the Creation of a M The journal of Policy, Regulation and Strategy for Telecommunications, Vol. 4, No. 3, pp. 50 56, 2002.

Liyi Zhang, JingZhua and Qihua Liu, A Meta analysis of Mobile Commerce Adaption and the Moderating Effect of Culture, Computer in Human Behavior , Vol. 28, pp. 1902-1911, 2012.

Muhib Ullah, Siffat and Ullah Khan, " Challenges and success factors in mobile commerce customer relationship management"., IOSR Journal of Computer Engineering (IOSRJCE), ISSN: 2278-0661, Vol. 2, No. 3, pp. 25-34, 2012.

Shuster, T., Pocket Internet and M-Commerce: How will it Fly? Working paper, George Washington University, Washington, DC, 2001.

Siau, K., Lim and Shen, Z, Commerce: Promises, Challenges and Research A , Journal of Database Management, Vol. 12, No. 3, pp. 4-13, 2001.