Revitalization of Business Strategy in Emerging Economies

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Contents

Factors Affecting Success of Mobile Banking Applications: A Qualitative Approach

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Abstract—*The emergence and penetration of Information technology (IT) is gaining momentum in today's business life and each and every business is putting efforts for reaching and serving their customers most effectively, to remain in the pace of competition, these requirements have forced each and every business to adopt Information technology to reach to their goals. Banking business is also adopting the technology very rapidly; adoption of mobile banking applications is a part of that drive. Banks are incurring huge expenditures on establishing the mobile banking application to penetrate banking services through mobile phone devices. This study is mainly concerned with analysis of determinants of success of these mobile banking applications in providing customer satisfaction and bringing loyalty among customers regarding the services of particular bank. In this study primary data regarding the views of mobile banking customers for the services and system established for providing these services is collected with the help of collection of reviews of various users while downloading the apps from Android and IOS tune platform and with the help of questionnaire method. In this study content analysis and principal component analysis is used to find out the main components to measure the success of mobile banking apps. This study stated that system quality, information quality and service quality are the main factors that affect the success of mobile banking applications.*

Keywords: *Mobile banking, Applications, Information System, factors, determinants, banking applications*

1. Introduction

Banking sector is increasing its expenditure on information technology in terms of establishing new applications for the usage of mobile banking in the era of economic downturns due to demonetisation. These economic conditions and increasing competition among the various financial institutions are putting pressure on the organisations to reduce their cost, so it becomes necessary for organisations to analyse the success and to do the cost-benefit analysis of the Information System (IS) used. The impact of this Information System (IS) is always indirect and can be measured and influenced by human aspect of the organisation, making the measurement of success and working of information System (IS) a complex and necessary step in any of the organisation. There are many ways to measure the success of Information System like return on investment as traditional method, and mesuring all the tangible and intangible benefits of the IS by adopting models created by researchers like model of Delone and McLean, 1992; model of Seddon, 1997; and model of Ballantine *et al.*, 1996. This study is concerned with analysing various detriminants of success of Information System (IS) used by banking sector to penetrate mobile banking with the help of DeLone and McLean model.

2. Literature Review

A variety of researches have been conducted to examine the success of IS model at individual as well as organization level. Moreover, the D&M model was mainly used to analyse the interrelationship of constructs at both the individual and organization level. Many studies have found that D&M model is very successful in evaluating utilitarian mode of Information System. The updated D& M model is a useful framework to understand the key success dimensions and their existing interrelationships, but other researches should be done to measure the use of D&M model in hedonic IS and further steps need to be taken by researchers to formulate a complete comprehensive and informative measure of IS Success (Petter, DeLone, & McLean, 2008).

Masoner, Lang, & Melcher, (2011) stated that information quality, perceived usefulness, system quality and user satisfaction as main factors that define the success of any information system (IS). Among all these variables information quality is the main independent variable and the user satisfaction as depandent variable that affect the success of any information system. Noh & Lee, (2016) has mainly focused on the intentions of the mobile banking users toward the acceptance of mobile banking app. This study focused on the factors that mainly affect the intentions of the users to continue the usage of mobile banking app with the help of using information system success and modified technology acceptance model. In this study, main emphasis was given to information quality, service quality, intention to use and trust. Attempts were made to establish the relationship among them. This study established that attitude of the customers toward banking application information and service quality, significantly affect consumer's intention to use mobile banking application. It was stated in this study that service quality played major role and both the models viz. Information System (IS) success model and technology acceptance model (TAM) were able to explain the behavior of the consumer in this study. Tam & Oliveira, (2016) suggested a model to find out the impact of mobile banking on individual performance of individuals by combining D&M model and TTF (Task Technology Fit) models. This study stated that system quality, information quality and system quality all are having positive impact on user satisfaction: system quality, information quality and TTF affect use of mobile banking. Task characteristics, technology characteristics, system quality and information quality positively impact TTF of mobile banking and it was also found in this study that use of mobile banking and user satisfaction have positive impact on individual performance. moreover moderating effects of TTF also impact individual performance of the users. This study stated that for any mobile manager to retain their customers to mobile banking; it is important that they focus on system quality, information quality and Task Technology Fit (TTF) of the system. Hossain M. A., (2016) in this study used the Information System (IS) success model to measure the success of Mobile –Health application. It was found in this study that intention to continue the system depends upon the perceived value of the system and user satisfaction and positive perceived values are having positive significant impact on user satisfaction. Budiwati & Kurniasih, (2014) mainly focused on finding the factors that mainly affect the success of

the mobile banking app of selected Indonesian banks viz. Permata bank Surakarta with the help of Delone and McLean Information Success model. Various statistical tools were used to measure the success of the banking application- such as Structural Equation Modeling (SEM), Chi square, Cronbach's Alpha and regression analysis. In this study the old version of D & M model was used, system quality consisted components ease-of-use, preferences, security and response time, and relevance, accuracy, information diversity and completeness were taken as the components of information quality. it was found that System quality variables had no impact on use but had impact toward user satisfaction(needs, efficiency, effectiveness and enjoyment): information quality had an impact on both use and user satisfaction; It was also found in this study that user satisfaction and net benefits do not affect use. This study stated that it's not the use but the user satisfaction that mainly affect the net benefits in terms of total benefit minus the cost to get the benefit,efficiency, performance quality and knowledge development of the customers. So it was concluded that D&M model is not apt for measuring the success of the mobile banking app. Chatterjee *et al.* (2009) replaced information quality with content quality (or nature of work), arguing that the characteristics of healthcare work, such as time pressure and task complexity, also play an important role. Other modifications involved investigating net benefits. Lin H.F., (2008) suggested member loyalty as a net benefit, claiming that loyalty was a more appropriate indicator of virtual community effectiveness. In this study, information quality and system quality were found to affect satisfaction, which in turn determined loyalty. Wang Y.S., (2008), perceived value and intention to continue using were treated as net benefits. Floropoulos, Spathis, Halvatzis, and Tsipouridou examined perceived usefulness as a benefit of using information systems, claiming that "if a system is used, it must be useful, and therefore successful." Halawi *et al.* (2007) replaced information quality and net benefits with knowledge quality and success when assessing the success of knowledge management systems.

3. Objectives of the Study

The main objective of this study is to finding major components/determinants and factor required for the success of Mobile Banking applications of Indian banks.

This study also focused on finding suitable model to analyzing the success of Information System adopted by various banks in establishing mobile banking services.

4. Research Methodology

4.1. Research Design

This study is exploratory in nature. This research design uses the qualitative techniques, here attempts are made to find out components required for the success of the Mobile banking app by recording the reviews of the users of these applications about the service quality and success of these apps from two platforms ; android and IOS Tunes, so this is an exploratory study in nature.

4.2. Sample Selection and Data Collection

Customers of banks in the Gujarat state will be selected as sample. Various components require for the success of app will be explored by studying the available literature and by analyzing the reviews and feedbacks of 420 customers while downloading the app or the related term

4.3. Statistical Tools

In this study Content Analysis is used to find out the various success factors of the app.

5. Analysis

5.1. Coding Scheme 1: Preliminary Data Analysis

In the first part of the study, reviews of the customers about the performance of applications o selected banks like SBI, ICICI bank, HDFC bank, Bank of Baroda, CITI Bank and Axis bank were collected from android and IOS platform due to their availability and popularity. Around 421 reviews were available regarding the quality of application of these banks on android and IOS tune platforms, but more reviews were available on android platform. These reviews were available from October 23, 2015 to March 2017, as reviews were collected on 15th March 2017.

Firstly these reviews were collected in Excel file and then these reviews were coded on the basis of meaningful phrases, like "Rubbish...Set some kind of easy way to register. Make app user friendly and then rollout to customers. Or train your bank staff to register customers" this phrase was coded as 'problem in login' 'not user friendly' and 'inefficient staff'.

In this preliminary stage initially total 48 codes were generated from the reviews of SBI bank app, later on the reviews of all other banking apps were coded and new codes of IMPS charges, SMS charges, UPI problem were added, and in total there were 66 codes.

5.2. Coding Scheme 2: Refined Coding based on Reviews

To reduce the redundancies these codes were grouped into various themes and subthemes likewise codes of compatibility with other devices and compatibility with other phones were coded under compatibility theme. Codes of working slow and fast were grouped under speed theme. Codes of login problem, registration problem, re-registration problem, password issue were grouped under initial operations. All the codes were grouped into 14 themes and 66 subthemes under Coding Scheme-2. These themes include compatibility, comparison, speed, information quality, performance, functionality error, service quality, convenience, user interface, security and others.

5.3. Coding Scheme 3: Refinement Based on Literature Review

In the coding Scheme-2 to reduce redundancies and to add the overlooked themes a list of themes was prepared based on all the existing theories, models and available literature. Theme of technical quality and functional quality and service environment were taken from Nordic model (Grönroos, 1984). Reliability, Responsiveness, Assurances, Empathy, and Tangibility themes were taken from SERVQUAL model (Parasuraman, Zeithaml, & Berry, 1985). System availability, efficiency, fulfillment and privacy were taken from E-S-QUAL model responsiveness, contact and compensation from E-RecS-Qual model. Themes of system quality, information quality, service quality, and System use and user satisfaction were taken from D&M IS Success model (DeLone & McLean, 2004). Theme of perceived risk/ Security and trust were taken from Lin, (2011).

On the basis of coding scheme-2 content analysis was done again and some themes were added from the list and some were ignored as that list was not a true representative of qualities required in mobile banking apps. That list only provided guidance in establishing new coding Scheme-3 on the basis of literature.

In this step further attempts were made to remove redundancies from this coding scheme, likewise compatibility and comparison shows relative advantage of the application so they were further grouped under one theme of relative advantage. Initial operations, user interface, error, security and performance showed the quality of the system, so those were grouped under technical or system quality. Functionality and information were grouped under information quality. Convenience was named as ease of use; perceived usefulness was also taken as one of the theme based on literature review. Moreover two constructs named attitude and overall performance were overlooked. They were further added in the construct list and again coding was done on the basis of these two construct for all the selected banks.

Table shows frequency of total responses under various heads. As it is clear from the table that technical or system quality possess highest frequency of 613, so it plays a major role in defining the success of mobile banking applications. The basic functions in technical or system quality includes initial operations; user interface; speed and good performance are most sought after factors in mobile banking followed by information quality, relative advantage and service quality having frequency of 143, 98 and 95 respectively. It is also clear that cost factor is considered not that much important in defining the success of these apps. Table-2 depicts the result of content analysis of all the reviews. The result is explained in percentage term.

Moreover after analyzing the frequencies it was felt that one construct of ease of usage can be merged with technical aspect of the applications, so in next step this construct of ease of usage was merged with technical and system quality. Cost factor is also considered but it is comparatively less stressed out than others as only 25 responses mentioned that factor, so this factor can be dropped from the list and can be merged into relative advantage.

The given Table-1 shows frequencies of all the themes and sub themes.

Table 1: Frequency Table of Coding Scheme 3

Themes	Sub-Themes	Frequency	Total Frequencies
Technical or system quality	Initial operations	208	613
	Error	28	
	User interface	116	
	Security	36	
	Speed	145	
	Performance	80	
Information quality	Functionality	109	143
	Information quality	34	
Ease of usage	Convenience	52	52
Service quality	Service quality	52	95
	Useful	43	
Cost	Cost	25	25
Compatibility and relative advantage	Compatibility	29	98
	Comparison	69	
	Total	1026	1026

(Source: calculation of frequency of reviews coded)

Table 2: Result of Content Analysis of all the Reviews

Themes	Sub-Themes	Percentage of Responses	Total Percentage of Responses
Technical or system quality	Initial operations	20.27	64.77
	Error	2.72	
	User interface	11.3	
	Security	3.5	
	Speed	7.79	
	Ease of usage	5.06	
	Performance	14.13	
Information quality	Functionality	10.62	13.93
	Information quality	3.31	
Service quality	Service quality	5.06	9.25
	Useful	4.19	
Compatibility and relative advantage	Cost	2.43	11.97
	Compatibility	2.82	
	Comparison	6.72	
Total		100	100

(*Source:* calculation done by author)

It is clear from the above table that around 65 percent of the respondents stated that technical or system quality is the major factor that mainly contributes to the success of mobile banking operations; in this factor initial operations like login, logout, registration process, generation of pass word and wrong user name and pass word plays a major role. Moreover the design, features, screen display, keys and outlook of the application is also very important to the users. Speed and performance and security are also desired by users under system quality. This table also depicted that information quality like, quantum of information, timeliness, usability and understandability of information is also considered important as per 14 percent of responses. 10 percent of the responses stated that mobile banking should have relative advantage than its counterpart like online banking and classical way of banking. 9.25 percent of the responses stated that service quality viz; support of staff, efficiency of the staff and other qualities like tangibility, empathy is also important in defining the success of mobile banking applications.

On the basis of this content analysis various determinants were found that are required for the success of mobile banking applications, these are listed out in the given Table-3.

This table shows all the dependent and independent parameters with their sub dimensions.

Table 3: Determinants of success of Mobile Banking Applications

Determinants of the Success of Mobile Banking Applications		
Type of Determinant	**Main Determinants**	**Sub Determinants**
Independent Parameters	System Quality	Initial operations
		Reliability
		Ease of use
		Response time/speed
		User interface
		Security
		Functioning/performance
	Information Quality	Understandability
		Completeness/quantum of information
		Timeliness
	Service Quality	Assurance
		Empathy
		Responsiveness
	Relative Advantage	Compatibility
		Comparison
		Cost

(Source: Compiled from content analysis)

On the basis of these given parameters it is felt that updated Delone &Mclean (D&M) Information System (IS) success model will be apt for analyzing the success of mobile banking applications, As this model mainly comprises more or less all the components and parameters as stated above except perceived innovativeness.

6. Conclusion

In this study all the reviews were analyzed using content analysis and it was found that System quality (initial operations, reliability, ease of use, user interface, response time, security and functionality), information quality (timeliness, correctness and completeness of information, and understandability), service quality (assurance, empathy, responsiveness) and relative advantage are the major components that are required for the success of any of the mobile banking application.

The most important determinant for the success of mobile banking application was considered as system quality that mainly comprises of initial operations or functioning of app, user interface, response time, security and reliability. In initial operations login problem and registration were major issues, while in user interface design of the app; user friendliness and screen display were the major concerns. Screen size should be apt to adjust to all kinds of mobile devices. Speed or response time is also very important to users; some users complained that application is slow and consuming long time. This problem of slow speed can be attributed to design of app, mobile network and wireless network. Functionality or various functions were also desired to be performed like checking account balance, IMPS transactions, NEFT transfer, UPI payment, monitoring of loans and investments and adding the beneficiary etc.

Quality of information like completeness, understandability, and timeliness were also important factors to users. Moreover users were making comparisons with other banking applications and were comparing relative advantages with their other counterparts. Users were evaluating trustworthiness, competitiveness and perceived innovativeness of their service providers with other banks. Some users were having positive attitude, while as some were having negative attitude toward overall performance up to that extent that they were suggesting others not to download the application or to switch the user.

Users were of the view that staff should be efficient enough to solve their queries and they should respond to their problems. So system quality is also one of the major determinants to the success of mobile banking applications.

In short it can be concluded that system quality, information quality, service quality and relative advantages are major determinants to define the success of mobile banking application. All these factors affect user satisfaction, perceived innovativeness and intention to continue using.

It is also found that De-lone and Mc lean model mainly accompanies all these aspects of Information System success, so that particular model is sufficient enough to measure the success of these applications.

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