

Customer Adoption and Attitudes in Mobile Banking in Sri Lanka

Prasansha Kumari

Abstract—This paper intends to identify and analyze customer adoption and attitudes towards mobile banking facilities. The study uses six perceived characteristics of innovation that can be used to form a favorable or unfavorable attitude toward an innovation, namely: Relative advantage, compatibility, complexity, trailability, risk, and observability. Collected data were analyzed using Pearson Chi-Square test. The results showed that mobile bank users were predominantly males. There is a growing trend among young, educated customers towards converting to mobile banking in Sri Lanka. The research outcomes suggested that all the six factors are statistically highly significant in influencing mobile banking adoption and attitude formation towards mobile banking in Sri Lanka. The major reasons for adopting mobile banking services are the accessibility and availability of services regardless of time and place. Over the 75 percent of the respondents mentioned that savings in time and effort and low financial costs of conducting mobile banking were advantageous. Issue of security was found to be the most important factor that motivated consumer adoption and attitude formation towards mobile banking. Main barriers to mobile banking were the lack of technological skills, the traditional cash-carry banking culture, and the lack of awareness and insufficient guidance to using mobile banking.

Keywords—Compatibility, complexity, mobile banking, risk.

I. INTRODUCTION

BANKING today has undergoing a radical transformation. The symptoms are obvious; new products, new players, new channels are appearing daily. This transformation is taking place across all sectors of the banking industry. Technology is a major force in this radical transformation that led to breaking the geographical, legal and industrial barriers and has created new products and services. The escalation and convergence of wireless telecommunications have created a tremendous potential platform for providing business services [1]. It is estimated that mobile phone users are approaching the three billion mobile subscriptions mark globally and advertisers and operators alike are keenly aware of the opportunity to connect with potential consumers through mobile phones [2]. The rapid growth of mobile technology and mobile devices have resulted in developing mobile banking into a simple information delivery channel in the current global banking industry.

Mobile banking refers to the provision and use of banking and financial services through mobile telecommunication devices such as mobile phones or tablets [3]. The scope of offered services may vary from merely making information available to availing general banking transactions such as

balance inquiry, transaction history, fund transfers, bill payments.

The earliest mobile banking services were powered by SMS communication, which was known as ‘SMS Banking’. Then gradually, Mobile Web was introduced and mobile banking was offered through WAP (Wireless Application Protocol). As WAP was restricted to a specific set of hand-sets, USSD (Unstructured Supplementary Service Data) came in to practice which permitted a real-time interactive access to bank accounts on many basic handsets. Today, with the proliferation of smart-phones, mobile banking has progressed to the use of special client programs, called Mobile Apps, downloaded to the mobile device used for mobile banking [4].

II. MOBILE BANKING IN SRI LANKA

Banking sector of Sri Lanka continues to perform its role of financial intermediation while the range of products and services offered as well as its outreach underwent further expansion. By the end of 2014, 23 banks comprising domestic banks and 12 branches of foreign banks continued operations while expanding the banking network and introducing new diverse banking solutions to attract new customers [5].

Adoption of mobile banking has become fundamental in the banking industry in Sri Lanka. Most commercial banks in the country are offering mobile banking within last few years. However, maturity level of mobile banking remains at a primary stage in the country. The case study of Tower Group [6] has introduced valuable guidelines to identify the maturity level in mobile banking. The study defines four levels as Informational, Transaction, Interactive and Orchestrate (6).

TABLE I
 MATURITY LEVEL IN MOBILE BANKING

<i>Informational</i>	<i>Transaction</i>	<i>Interactive</i>	<i>Orchestrate</i>
View balance, transaction history	Remote deposit capture	Actionable alerts	Opt-in preference management: marketing alerts, offers and POS coupons
SMS alert	Balance transfer	Personal Financial Management	Location and context aware services
All modalities	Bill pay	Mass marketing	Lifestyle management
ATM finder etc.	Stock payments	Transaction verification	Cross-channel process management
	P2P payments		

Source: Adapted from [6]

Prasansha Kumari is with the University of Kelaniya, Sri Lanka (e-mail: prasanshakumari@yahoo.com).

As indicated in Table I, Tower group's model illustrates four maturity levels in terms of the sophistication of the features of the mobile banking solutions. The model defines mobile banking progression from the information stage to being a part of lifestyle management for customers engaged in largely non-financial activities. The Sri Lankan mobile banking sector has currently introduced information and transaction level facilities. The following can be identified as the most common mobile banking features provided by local banking sector,

- o Balance inquiry
- o Fund transfers between own and third-party accounts
- o Information on account history
- o Information on Locate ATMs and branches
- o Credit card and utility bill payments
- o Cheque status inquiry
- o Cheque book request
- o Change PIN/ password
- o Alerts on account activity
- o Mobile recharging

III. RESEARCH OBJECTIVE

This study attempts to analyze the factors that may influence the consumer's adoption and attitude of mobile banking services in Sri Lanka.

IV. HYPOTHESES OF THE RESEARCH

Based on the framework for perceived innovation characteristics [7], the following hypotheses are constructed.

- H1. Relative advantage has a positive effect on consumers' adoption of mobile banking services
- H2. Trialability has a highly significant influence on consumers' adoption and attitude of mobile banking services
- H3. Compatibility has a highly significant influence on consumers' adoption and attitude of mobile banking services,
- H4. Observability has a highly significant influence on consumers' adoption and attitude of mobile banking services
- H5. Complexity has a highly significant influence on consumers' adoption and attitude of mobile banking services
- H6. Perceived Risk has a highly significant influence on consumers' adoption and attitude of mobile banking services

V. RESEARCH METHODOLOGY

To attain the study objectives, the study used six perceived characteristics of innovation that can be used to form a positive or negative attitude towards adoption, namely: relative advantage, compatibility, complexity, trailability, perceived risk, and observability. The research data was done through a structured questionnaire. The questionnaire consisted of 16 questions measuring six variables. The questionnaire was administered to a randomly selected 200 sample of both private and government commercial bank customers in Colombo, Sri

Lanka. Only the selected sections of the survey data will be used in the present paper. The quantitative data was analyzed using Pearson Chi-square test by SPSS-program.

VI. THEORETICAL BACKGROUND

A considerable amount of research on mobile banking services has emerged during the past decades. Customer Adoption of mobile banking has received research attention in recent years. In the search to understand consumers' adoption of innovation, and where research has focused on the consumer perspective, Rogers' diffusion model [7], which originally dates back to 1962, has often been employed [8], [9]. Within financial services innovation research, [9]-[11] have applied Rogers' model to mobile banking.

According to [7], the perceived innovation characteristics are supposed to provide the framework on how potential adopters perceive an innovation. Research that have investigated the product characteristics of innovation generally endorse evaluating the innovation along the product characteristics that involve five constructs; relative advantage, compatibility, complexity, trialability and observability [12]. The concept of perceived risk is often included as augmented by [13]. Particularly in banking services, the perceived risk associated with the financial product itself as well as with electronic delivery channel is higher than in basic consumer goods, thus increasing the importance of this characteristics of innovation [14]. Ensuring security and confidentiality are the fundamental prerequisites before any banking activity involving sensitive information can take place [15]. Relative advantage, trialability compatibility and observability are positively influence to adoption of an innovation and complexity and perceived risk are negatively influenced [7]. These innovation characteristics and their influence on adoption and attitude of mobile banking services are detailed under empirical implications by [16].

VII. DATA ANALYSIS AND RESULTS

Table II indicates the usage of mobile banking and Table III illustrates a summary of the study's respondents' demographic information. The demographic profile by age, sex, educational level, employment, income and living areas too are summarized.

TABLE II
 USAGE OF MOBILE BANKING

Question	Yes	No	Total
Do you use mobile banking?	74	126	200
	Regularly 46		
	Occasionally 28		
Are you willing to use mobile banking	132	68	200

As illustrated in Table II, only 37 percent of the consumers use the mobile for conducting banking transactions. While the majority of 63 percent do not use the mobile phone for banking related services.

TABLE III
SUMMARY OF DEMOGRAPHIC INFORMATION OF RESPONDENTS

Demographic Characteristics	Number of customers	Percentage
Gender		
Male	46	62.1
Female	28	37.9
Total	74	100.00
Age		
18-28	31	41.90
29-39	24	32.43
40-49	11	14.87
50-59	05	06.75
60-69	03	04.05
70 and above	00	00.00
Total	74	100.00
Occupation		
Public Sector	13	17.57
Private Sector	40	54.05
Own Business	11	14.87
Not working	02	2.70
Retired	03	4.05
Student	05	6.76
Other	00	00.00
Total	74	100.00
Education		
<O/L	02	2.70
<A/L	05	6.76
First degree	32	43.24
Postgraduate	33	47.29
Other	02	2.70
Total	74	100.00
Income (Rs)		
1,000- 20,000	04	5.40
20,001- 40,000	14	18.92
40,001- 60,000	10	13.51
60,001- 80,000	23	31.08
80,001-100,000	22	29.74
100,001 and above	01	1.35
Total	74	100.00
Living Area		
Urban	46	62.1
Rural	28	37.9
Total	74	100.00

As shown in Table III, 74 of the customers who used mobile banking consisted 62.1% of males while females were 37.9%. Age groups show that youngest category (18-28) indicated the highest percentage with 41.9% of mobile banking usage, while the percentage was 32.43% for the age group between 29-39 years. The third category was for the age group between 40-49 years projects a 14.87 percentage while the age group between 60-69 years received the lowest percentage of 4.05. With regards to occupation, Table III shows that 54.05 percentage of private sector workers, while the percentage was lower for workers in the government sector which was 17.57%. While the usage of mobile banking for own business accounted 14.87% of the respondents, the smallest percentage goes to the unemployed which was 2.70% and retired with 4.05%. Considering education, the highest percentage was 47.29% for respondents with a postgraduate degree, and the second

category was for users with bachelor's degree which was 40.54% of the study sample. While for respondents with O/L and A/L or less it was a low 9.46%. The results show that 31.8% of the study sample was of those who earn a monthly income level RS. 60,001-80,000 while the percentage was 29.74% of those whose income is from Rs. 80,001-100,000. The lowest percentage of 1.35% was for those had an income higher than Rs.100, 001. The last category was for the living area; 62.1 present users were living in urban areas while 37.9 % users were in rural areas.

VIII. MAIN MOBILE BANKING FACILITY USAGES BY BANK CUSTOMERS IN SRI LANKA

Tower group's model in [6] illustrates four maturity levels in terms of the sophistication of the features of the mobile banking solutions. According to their maturity level, Fig. 1 indicates percentages of main mobile banking features used by customers of mobile banking in the sample. The results show that over 75% (56/74) of users used only information level mobile banking facilities such as balance inquiry, information transaction history, information on account history and information on locating ATMs and branches. 21.6% (16/74) of the users have used transaction stage mobile banking features while 2.7% (2/74) of the users used mobile banking for interactive purposes.

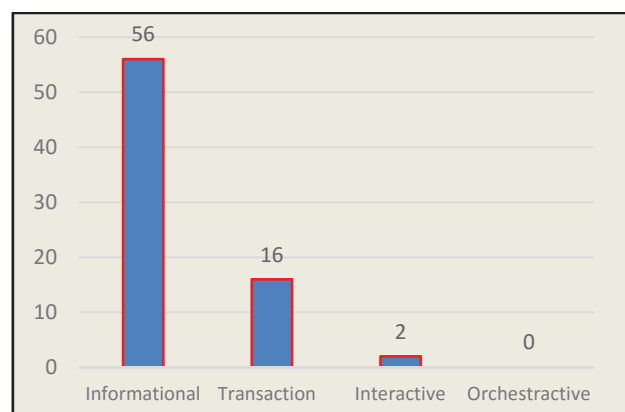


Fig. 1 Main mobile banking feature usage by bank customers in Sri Lanka

According to Rogers (1995) [7], the degree of relative advantage is often expressed as economic profitability, social prestige, and savings in time and effort, immediacy of the reward or as decrease of discomfort. As the major positive reason for adopting mobile banking services the accessibility and availability of services regardless of time and place are named. Over 76% of the respondents mentioned that savings in time and effort and financial costs result from conducting mobile banking. Security and trustworthiness of usage of service was mentioned to be the most important factor within both users and non-users when deciding on banking service delivery channel. Over 80 present of survey participants responded that risk is a significant factor for less adoption and attitudes towards mobile banking. Complexity is an affected

reason for less adoption and attitudes towards mobile banking. The perception of complexity involved when conducting financial transactions via mobile channel is often inversely related to a consumer's experience with technology in general [17]. Over 75 users mentioned that insufficient guidance and awareness in using mobile banking and malfunction of service were the main problems to adoption to mobile banking. Comparability is highly significant reason for adoption and attitudes towards mobile banking. Respondents mentioned their attitudes towards technology-based products and services. Mobile (79%) and personal computer (61%), indicate that the respondents were pretty enthusiastic about using technology, except electronic ID-card and cable television.

Observability of an innovation describes the extent to which an innovation is visible to other members of a social system, how easily the benefits can be observed and communicated. [7]. In this survey respondents mentioned they had gained information of mobile banking services from marketing communication activities, such as advertisements users (62.1%), non-users (57.1%) and from banks (18.9% users and

49.2% non-users) and other observation users 21.6% and non-users 18.2. In this survey 46% of non-users had experimented with mobile banking services. It seems a positive trend to encourage the usage of mobile banking in future.

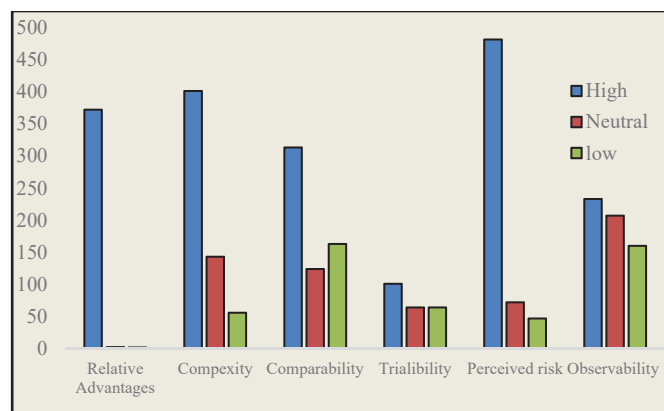


Fig. 2 Factors influencing for adoption and attitudes of mobile banking

TABLE IV
FACTORS INFLUENCING ADOPTION AND ATTITUDES OF MOBILE BANKING

User	Non user	Total	User	Non user	Total	User	Non user	Total
1. Relative advantage								
40	56	96	29	53	82	05	17	22
57	96	153	11	21	32	06	09	15
47	76	123	18	46	64	09	04	13
2. Complexity								
37	85	122	30	38	68	07	03	10
43	100	143	24	13	37	07	13	20
42	94	136	23	15	38	09	17	26
3. Comparability								
56	102	158	11	21	32	07	03	10
35	87	122	28	27	55	11	12	23
12	21	33	17	20	37	45	85	130
4. Trialability								
43	58	101	24	40	64	07	28	35
5. Perceived risk								
67	109	176	05	07	16	00	08	08
63	106	169	07	11	18	04	09	13
42	94	136	18	20	38	14	12	26
6. Observability								
14	62	76	33	52	85	27	12	39
46	72	118	16	30	46	12	24	36
16	23	39	26	50	76	32	53	85

Table V illustrates the results of hypotheses testing of this study. To test hypothesis 1, Pearson Chi-Square was calculated relative advantages as independent variable and attitudes and adoption of mobile banking as the dependent variable. The calculated null hypothesis is rejected with a (χ^2) chi value of 37.411 at 5 percent level of significance. It was significantly related to mobile banking adoption. Therefore, hypothesis 1 is accepted. For testing second hypothesis, complexity as independent variables and attitudes and adoption of mobile banking as dependent variable. The null hypothesis is rejected with calculated χ^2 value of 21.732 at 5 present level of significant. It shows a significant relationship to mobile

banking adoption and attitudes. As shown in Table V, the third hypothesis is accepted. It has taken Comparability as dependent variable and attitude and adoption of mobile banking as independent variable. The P count for third hypothesis, null hypothesis rejected with a calculated χ^2 value of 246.64 at 5 present significant level. Thus it also shows a significant relationship between dependent and independent variables. While for the fourth hypothesis, χ^2 value was calculated between trialability as an independent variable and mobile banking adoption and attitudes as dependent variable. There is a significant relationship between trialability and mobile banking adoptions. The calculated χ^2 value is 32.830 and null

hypothesis is rejected for calculated, χ^2 value of at 5 present. As indicated in Table V, fifth hypothesis was also tested by using same statically method. Perceived risk used as the independent variable and mobile bank adoption and attitudes as dependent variable. According to Table V, χ^2 value is 29.047 and null hypothesis is rejected at 5 present significant level. Due to significant relationship between two variables the fifth hypothesis is also accepted. The last hypothesis as mentioned in the table is accepted. Observability as the independent variable and mobile bank adoption and attitudes as dependent variable were used for testing sixth hypothesis. The χ^2 value is 80.606 and null hypothesis is rejected at 5 present level of significant. There is a highly significant relationship in between the two variables.

TABLE V
HYPOTHESES TESTING

Independent Variable	Dependent variable	χ^2 Value	P Value	Result
H1: Relative advantages	attitudes and adoption of mobile banking	37.411	.000	Accepted
H2: Complexity	attitudes and adoption of mobile banking	21.732	.000	Accepted
H3: Comparability	attitudes and adoption of mobile banking	246.068	.000	Accepted
H4: Trialability	attitudes and adoption of mobile banking	32.830	.000	Accepted
H5: Perceived risk	attitudes and adoption of mobile banking	29.047	.000	Accepted
H6: Observability	attitudes and adoption of mobile banking	80.606	.000	Accepted

IX. CONCLUSION

The results of this study is supported by many previous research such as by [7], who explored the potential factors that may influence the intention of mobile banking services. Roger introduced six characteristics towards adoption and attitudes of mobile banking among customers namely; relative advantage, compatibility, complexity and trialability, perceived risk, the research findings show that all the six factors influence consumer adoption of mobile banking services in Sri Lanka. According to the results of this study, relative advantage, risk and complexity are the strongest influence in building consumer adoption and attitudes towards mobile banking in Sri Lanka. Many researchers [18], [19] have identified that few factors mainly affected the adoption mobile banking. In this research it was found out that all six factors have a significant influence for adoption and innovation in mobile banking. Relative advantages were highly influential in enhancing customer adoption towards mobile banking while risk and complexity were identified as the barriers. Comparability, tiarability and observability have been identified as the second significant factors towards adoption of mobile banking in Sri Lanka.

REFERENCES

[1] Khraim, H.S., Shoubaki, Y.E. and Khraim, A.S. (2011). Factors affecting Jordanian consumers' adoption of mobile banking services, *International Journal of Business and Social Science*, 2 (20), pp. 96-105. Rogers 1995.
[2] Hibberd, M. (2007). Put your message here. *Mobile Communication International*, 40-44.

[3] Goyal, V. (2012), *Mobile Banking in India: Practices, Challenges and Security Issues*. Retrieved Oct 30, 2015, from http://www.academia.edu/2958786/Mobile_Banking_in_India_Practices_Challenges_and_Security_Issues
[4] Dandeniya, S. (2014), *Expanding Financial Services Frontier and Mobile Banking Sri Lanka, Manager IT Risk, Commercial Bank of Ceylon PLC*.
[5] Central Bank, Sri Lanka, *Annual Report (2014)* Retrieved Oct 30, 2015, from http://www.cbsl.gov.lk/pics_n_docs/10_pub_docs/efr/annual_report/AR2014/English/content.htm
[6] *Mobile banking case studies. Case study 1: Tower Group, Mobile banking maturity model.* (2010: Slide 4). Retrieved Oct 30, 2015 from <https://www.hitpages.com/doc/5155909328175104/4#pageTop>
[7] Rogers, E. M. 1995. *Diffusion of innovations*. 4th edition. New York: Free Press.
[8] Howcroft, B., Hamilton, R. and Hewer, P. (2002), "Consumer attitude and the usage and adoption of home-based banking in the United Kingdom", *The International Journal of Bank Marketing*, Vol. 20 No. 3, pp. 111-21.
[9] Black, N. J. & Lockett, A. & Winklhofer, H. & Ennew, C. (2001). The adoption of Internet financial services: a qualitative study. *International Journal of Retail and Distribution Management*. Vol. 29 (8), pp. 390-398.
[10] Polatoglu V. N. & Ekin, S. 2001. An empirical investigation of the Turkish consumers' acceptance of Internet banking services. *International Journal of Bank Marketing*. Vol. 19(4), pp. 156-165.
[11] Tan, M. & Teo, T. S. H. 2000. Factors influencing the adoption of Internet banking. *Journal of the Association for Information Systems*. Vol. 1 (5), pp. 1-42.
[12] Moore, G.C. & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, Vol:21, No:3, pp.192-222.
[13] Bauer, R.A. (1960): Consumer behavior as risk taking. In: Hancock R.S., *Dynamic Marketing for a Changing World*, Proceedings of the 43rd Conference of the American Marketing Association, pp. 389-398.
[14] Harrison, T. (2000). *Financial services marketing*. Wiltshire: Prentice Hall.
[15] Jayawardhena, C., & Foley, C. (2000). Changes in the Banking sector - The case of Internet banking in UK. *Electronic Networking Application and Ploicy* Vol.10, p.19-30.
[16] Mattila, M. (2002). Factors affecting the Adoption of Mobile Banking Services, *Journal of Internet Banking and Commerce (JIBC)*. Retrieved Oct 30, 2015, from <http://www.arraydev.com/commerce/jibc/0306-04.htm>
[17] Mahajan, V. & Muller, E. & Srivastava, R. K. (1990). Determination of adopter categories by using innovation diffusion models. *Journal of Marketing Research* Vol. 27 (1), pp. 37-50., 45.
[18] Irwin, Zaheeda Cajee, Douglas Daves and Shuan, Stroebel, (2003). Cell phone banking: Predictors of adoption in South African exploratory study. *International Journal of Information Management*, 23, 381-394.
[19] Deans, Kenneth R., and Gray Brendan J. (2010). Third screen communication and the adoption of mobile marketing: A Malaysia perspective. *International Journal of Marketing Studies*, Vol. 2, No. 1; May 2010.