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Maximising the Usage of Mobile Banking: A New Channel for Financial Inclusion

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ABSTRACT

Financial Inclusion is widely recognised today as an effective enabler for poverty alleviation, economic development and social welfare. Cost-effective, sustainable, innovative and technology-enabled channels like digital banking, mobile banking, etc play an undeniable role in scaling up the usage of formal financial services, especially in developing countries like India. In this research paper, the authors attempt to explicate to what extent the changes in 'Behavioural Intention' and 'Actual Usage' of mobile banking services can be explained by the combination of six exogenous variables. As an original contribution of this study, 'Familiarity' is proved to be a significant factor in the domain of mobile banking. The empirical data collected through 147 questionnaires are analysed using PLS-SEM analysis (Smart PLS 3.0), One Way between groups ANOVA, and Independent samples t-test (SPSS 22.0).

JEL Classification: G21, L96, O33.

Keywords: Mobile Banking, Technology Adoption, Financial Inclusion, Familiarity, SmartPLS.

1. INTRODUCTION

Financial Inclusion has been widely recognised and recommended as an effective strategy in the developing countries for poverty reduction, economic development, and social welfare. World Bank has emphasized the significance of financial inclusion in realising the transformative power and to accelerate developmental gains. This is more relevant to a country like India where the Government policies have been progressive in uplifting the standard of living of its citizen through several cost-effective, transparent, and populace measures. Policies of Government of India have been pro-information technology, pro-indigenous industrialisation and pro-poverty alleviation. The Government along with the Bank supremo Reserve Bank

of India (RBI) have been developing viable models for serving the lower income group at a lower transaction cost (Ambarkhane D et. al., 2016). But, the private sector commercial banks of India have been reluctant in serving unprofitable lower income groups owing higher transaction cost for their financial services.

Though there are several leading financial inclusion models like Micro Credit, SHG-Bank Linkage, Micro Finance, Business Correspondence, and Small Finance Banks serve the poor financial, it should be understood that no single institution or a model can cater to and monitor all the financial needs and supplies of large population. The mobile banking has been identified as one of the effective channel for initiating and delivering the financial services at lower transaction cost (Tarhini A, 2016). It affirmed as a successful model for providing the financial services to the targeted populace in many developing countries such as Kenya, Brazil, etc.

Mobile Banking refers to the online banking transactions performed through a mobile device. Making bank account transactions, checking bank account, tracking the status of cheques issued, making online payments and online purchases, etc. can be performed through mobile phone (Tiwari et. al., 2007). Mobile Banking is to be distinguished from Mobile Payment. Eventhough financial transactions takes place through mobile device, the mobile payment in itself need not to be attached with a bank account (Karnouskos & Fokus, 2004).

Mobile banking transactions creates time utility and space utility. Mobile banking aids in availing banking services from remote locations at any time. Cost of visiting banks, ATMs, meeting business correspondents, etc. for regular and low-value transactions can be minimised through the mobile banking (Hanafizadeh et. al., 2014; Yousafzai, 2012). The routine simplification through mobile banking enhances penetration of banking services and their usage irrespective of geographical area, its demographics and other constraints like income, cost, availability of banking personnel etc. The higher penetration level of smart phones, increasing proportion of tech-savvy young generation, more user-friendly mobile applications, and wider availability of data network at cheaper rate is expected to propel the usage of mobile based banking services.

Research Gap: Many researches have attempted to measure various perceptions and attitudinal factors that explain the behavioural intention to use the mobile banking system. But, empirical evidence to measure and affirm the influence of 'Familiarity' towards using mobile banking services is unavailable / non-existent. Familiarity refers to acquaintance with interface, terms and icons used in the mobile banking applications.

It should also be noted that UTAUT model (Venkatesh et. al., 2003) and UTAUT II model (Venkatesh et. al., 2012) have been widely employed in the domain of technology adoption and usage. These studies have attempted to define the technology adoption in terms of the attitude, experience, and perceptions of the potential customers to use technology. Many researchers have suggested adding more factors to the existing UTAUT models would better explain and refine the reasons for technology acceptance and adoption (Tarhini A, 2016; Abrahao, 2016).

The genesis of this research is based on the concluding remark of *Ali Tarhini (2016)* who has stated that *'future research studies could include the predictor variables such as Familiarity in the context of mobile banking'*.

This research includes Perceived Risk and Familiarity along with the four exogenous variables identified by UTAUT model (Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions) to explain the changes in the endogenous variable, i.e. Behavioural Intention,

Research Problem: Though the penetration level of mobile phones and internet data networks are commendably high in India, the usage of the mobile banking services has not grown as expected (Cruz et. al., 2010). Further, the share of financial transactions through mobile banking is considerably low in comparison with total volume of banking transactions (Chian Son, 2012). It is also noted that reduction in transaction cost and inclusion of several mobile banking services has not encouraged the use of mobile banking technology proportionately in India.

Research objectives:

1. To examine whether the 'Familiarity' significantly explains the change in the Behavioural Intention.
2. To what extent does the change in 'Behavioural Intention' (BI) is explained by the individual and combined effects of 'Performance Expectancy' (PE), 'Effort Expectancy' (EE), 'Social Influence' (SI), 'Facilitating Conditions' (FC), and 'Perceived Risk' (PR), 'Familiarity' (FA).
3. To what extent does the change in the 'Actual Usage' (AU) is explained by 'Behavioural Intention' (BI).
4. To examine whether PE, EE, SI, FC, PR, FA, BI, and AU varies with Gender, Age, Education level, and Income level.

The structure of the research paper is as follows: at first, the theoretical backgrounds of each constructs and the source of its scaled items are stated. Secondly, the research design is dealt with, followed by data analysis and interpretation. Finally the research paper concludes with findings, suggestions and conclusions.

2. THEORETICAL BACKGROUND

Several researches where conducted to understand the behavioural intention to use the mobile banking technology. Barati & Mohammadi (2009) used the constructs Perceived ease of use, Perceived usefulness, Facilitating Conditions, Social and cultural factors, and innovation in order to define the effect on BI to use Mobile Banking. Ali Tarhini et. al., (2016) employs the constructs such as PE, EE, SI, FC, Perceived Credibility (PC), and Task Technology Fit (TTF) in measuring the BI, and AU. Ricardo de Sena Abrahaoa et. al., (2016) has studied the impact of the concepts such as PE, EE, SI, PR, and Perceived Cost on determining the BI. Chian-Son Yu (2012) also conducts studies on individual intention to use mobile banking by assessing the influence of PE, EE, SI, PC, FC, and Perceived self-efficacy. Yong-Ki Lee (2012) has used the constructs Perceived Usefulness, Perceived Ease of use, Task Fit, Monetary Value, Connectivity, Personal Innovativeness, and Absorptive Capacity to study on the Usage Intention of mobile banking customers.

This research paper makes use of eight, i.e. PE, EE, SI, FC, PR, FA, BI, and AU. Among these constructs, five constructs (PE, EE, SI, FC) and its scaled items has been adopted from UTAUT model (Venkatesh et. al., 2003). While many further studies attempt to explain the technology acceptance by adding extra constructs, PR has been identified as an significant variable (Tarhini A, 2016; Abrahao, 2016; Chian Son Yu, 2012). These constructs are explained in detail.

Working Definitions and Literature Support

Table 1
Working Definitions and Literature Support

Variable	*Code*	*Working Definition*	*Relationship*	*Literature support*
Performance Expectancy	PE	Degree to which a user perceives that using the new technology would help him in attaining the expected outcome at a reduced cost, time, effort, money and other intangibles	PE has a significant influence on BI	Venkatesh et. al., (2003); Zhou et. al., (2010); Riquelme &Rios (2010); Sripalawat et. al., (2011); Venkatesh et. al., (2012); Silveira (2012); Martins et. al., (2014); and Tarhini et. al., (2014)
Effort Expectancy	EE	Degree to which the user perceives the easiness associated with the usage of new technology	EE has a positive influence on BI.	Venkatesh et. al., (2003), Venkatesh & Martins et. al., (2014); Dasgupta et. al., (2011); and Tarhini et. al., (2013)
			EE is not a significant predictor of BI	Zhou et. al., (2010) and Yu (2012)
Social Influence	SI	Degree to which a user believes that others (relative, friends, well-wishers, etc) want him to use the technology	SI has a positive influence on BI.	Venkatesh et. al., (2003); Zhou (2012); Martins et. al., (2014)
Facilitating Conditions	FC	Degree to which a user perceives that an organisation and its infrastructure would help him to use the new system	FC significantly influences BI.	Venkatesh et. al., (2003); Yu (2012); and Im et. al., (2011).
Perceived Risk	PR	Degree to which a user feels how much credible and safe it is to make the financial transactions through the mobile banking technology; how much privacy and confidentiality of sharing the personal information would be kept.	PR significantly influences BI.	Featherman and Pavlou (2003); Brown et. al., (2003); Yuen et. al., (2010); Dasgupta et. al., (2011); Zhang et. al., (2012); Martins et. al., (2014)
			BI depends on the level of trust	Harfouche (2010)
Familiarity	FA	State of being acquainted with the use of a system; being more familiarised with the interface, terms, icons, and relevant services in the technology.	BI including FA as one of the predictor of BI	Gefen (2000); Gefen et. al., (2003); Tarhini (2016)
Behavioural Intention	BI	Readiness of a user to use the system for the first-time, repeat / continued use and its patronage		Venkatesh & Davis (2000); Shafinah et. al., (2013)

Hypotheses

H_1 PE significantly affects BI to use Mobile banking services.

H_2 EE significantly affects BI to use Mobile banking services.

H_3 SI significantly affects BI to use Mobile banking services.

H_4 FC significantly affects BI to use mobile banking.

H_5 PR significantly affects BI to use mobile banking.

H_6 FA significantly affects BI to use mobile banking.

H_7 BI significantly affects AU of mobile banking.

H_8 PE, EE, SI, FC, PR, FA, BI, and AU vary with Gender, Age, Education, and Income

3. RESEARCH DESIGN

This descriptive research aims to capture, analyse and report the factors and their degree of influence in adopting mobile banking technology. The study has employed structured self-explanatory questionnaire to collect responses. 28 scaled items has been used to measure 8 constructs on a five-point Likert scale.

Convenient sampling technique is adopted to collect response from 153 respondents hailing from Thrissur district of Kerala, India. This district is a progressive since 2010; and in 2013 it is one of the top rung states with 100% financial inclusion as per CRISIL Inclusix 2013. The sample units include natives above 18 years, with no other predefined characteristics.

Pilot study on 20 samples to affirm the validity and appropriateness of the questionnaire was conducted. The pilot study lead to the removal of six defective questions with a high degree of explicit defects (more than 20% questions are not filled, same response for all the questions, etc.).

The data cleaning and editing was done in two stages: (1) Field editing: Data collected was scrutinised, and contacted the respondents again in order to gain insight on the open-ended questions that were ambiguous and required further clarifications and corrections, if found necessary. (2) Central Editing: The missing values in the data collected were edited through central editing process; the values were replaced using series means. The outliers have been normalised using series mean.

Conceptual Model

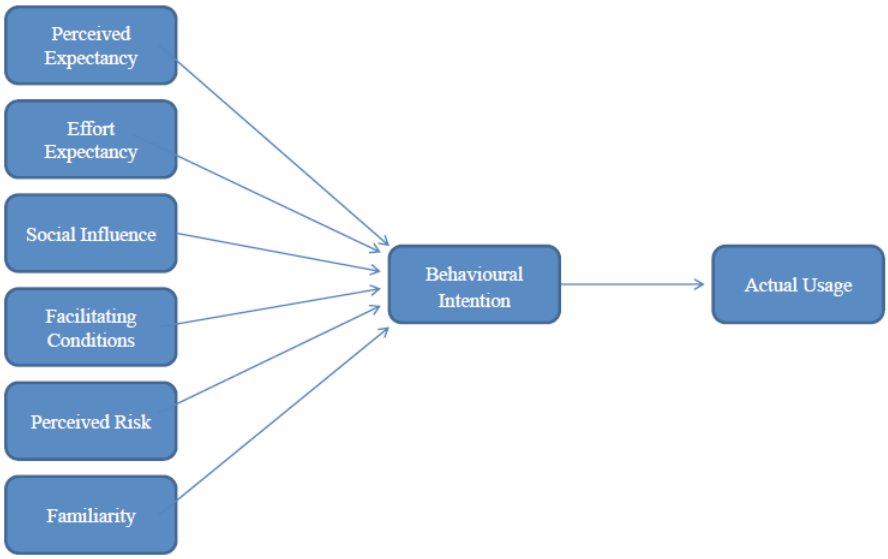

Figure 1: Conceptual Model

Methodology

The proposed research models attempts to measure the impact of FA along with other exogenous variables PE, EE, SI, FC, PR on the endogenous variable - BI. The scientific validation of all the constructs is

performed prior to application and inference. The study appropriately uses PLS - SEM (Smart PLS 3.0), One-Way ANOVA, and Independent Sample t-test (SPSS 22.0) as the various statistical tools for data analysis and hypothesis testing.

4. RESULTS AND DISCUSSIONS

Descriptive Statistics

Descriptive statistics of this research are included in Table 2. It provides a quick glimpse on the distribution of the samples across different demographic variables.

Table 2
Descriptive statistics

Variables	*Characteristics*	*Frequency*	*Percentage*
Gender	Male	79	53.7 %
	Female	68	46.3 %
Age	Below 20 Years	31	21.1 %
	20 - 29 Years	47	32.0 %
	30 - 39 Years	21	14.3 %
	40 - 49 Years	25	17.0 %
	50 & Above Years	23	15.6 %
Education Level	Higher Secondary	24	16.3 %
	Bachelor Degree	31	21.1 %
	Master Degree	48	32.7 %
	Above Masters	44	29.9 %
Monthly Income	Below 10,000	23	15.6 %
	10,000 - 24,999	31	21.1 %
	25,000 - 49,999	32	21.8 %
	50,000 - 99,999	37	25.2 %
	1 Lakh & Above	24	16.3 %

Measurement Model

The data was first analysed to assess the reliability and validity of the constructs used in the instrument of study. 28 scaled items are used to measure 8 constructs in this research paper, i.e. PE (4 items), EE (4 Items), SI (4 Items), FC (4 items), PR (4 items), FA (4 items), BI (3 items), and AU (1 item). Factor loading expresses the relationship of each indicator (scaled item) with its construct. All the items meet the threshold value for factor loadings (0.7), i.e. PE (.826, .804, .853, .815); EE (.797, .733, .831, .795); SI (.765, .870, .733, .726); FC (.855, .851, .768, .760); PR (.732, .814, .846, .772); FA (.763, .872, .811, .806); BI (.844, .874, .851); AU (1.000). Cronbach's Alpha indicates the internal reliability. The Cronbach's Alpha co-efficient of all the constructs (.843, .800, .776, .824, .801, .830, .818, and 1.000) is above the threshold value of 0.7, which suggest that all the items of each construct have relatively high internal consistency.

Table 3
Test on Cronbach's Alpha, CR, and AVE

Constructs	*Items*	*Mean*	*SD*	*C. Alpha*	*CR*	*AVE*
PE	4	4.11	0.61	0.843	0.895	0.680
EE	4	3.94	0.55	0.800	0.869	0.624
SI	4	3.71	0.63	0.776	0.857	0.601
FC	4	3.79	0.63	0.824	0.884	0.656
PR	4	3.55	0.63	0.801	0.870	0.627
FA	4	3.69	0.63	0.830	0.887	0.663
BI	3	3.68	0.73	0.818	0.892	0.733
AU	1	3.35	0.77	1.000	1.000	1.000

According to Hair et. al., (2010), the Composite Reliability (CR) is used to measure the reliability; Average Variance Extracted (AVE) for establishing convergent validity. While the Cronbach's Alpha measures the individual item reliability, CR indicates the extent to which the set of latent reflect the measure the individual construct. The threshold value for CR is 0.7 (Fornell & Larcker, 1981); all the constructs in the study are having a CR value above 0.857. The threshold value for AVE is 0.5 (Hair et. al., 1998); all the constructs are above 0.603. Convergent validity assesses whether the indicators of a construct measure the construct properly and ensures the indicators of a construct represent the specific construct aloe, and not the other constructs. It shows uni-dimensionality of an item and construct.

Table 4
Discriminant Validity

	AU	*BI*	*EE*	*FC*	*FA*	*PE*	*PR*	*SI*
AU	1.000							
BI	0.779	0.856						
EE	0.567	0.733	0.790					
FC	0.587	0.754	0.695	0.810				
FA	0.443	0.615	0.604	0.640	0.814			
PE	0.562	0.737	0.665	0.697	0.554	0.825		
PR	-0.354	-0.500	-0.379	-0.486	-0.179	-0.436	0.792	
SI	0.627	0.757	0.662	0.697	0.520	0.721	-0.476	0.775

Discriminant validity ensures the indicators of one construct are not related to any other constructs. Each measurement item is strongly related to the measured construct; and weakly related with all other constructs except for the one to which it is theoretically associated.

Here in the Table IV, the highest level of relation of each scaled items are to its own measured construct than other constructs in the model. All the diagonal values are higher than the non-diagonal in the corresponding columns and rows and columns; so the discriminant validity is supported.

Structural Model

The structural model (Figure 2) is designed to examine and measure The extent to which PE, EE, SI, FC, PR, and FA significantly explains the change in the BI; and that BI explains changes in AU. The hypotheses proposed for testing through this model include $H_{1\text{-}7}$

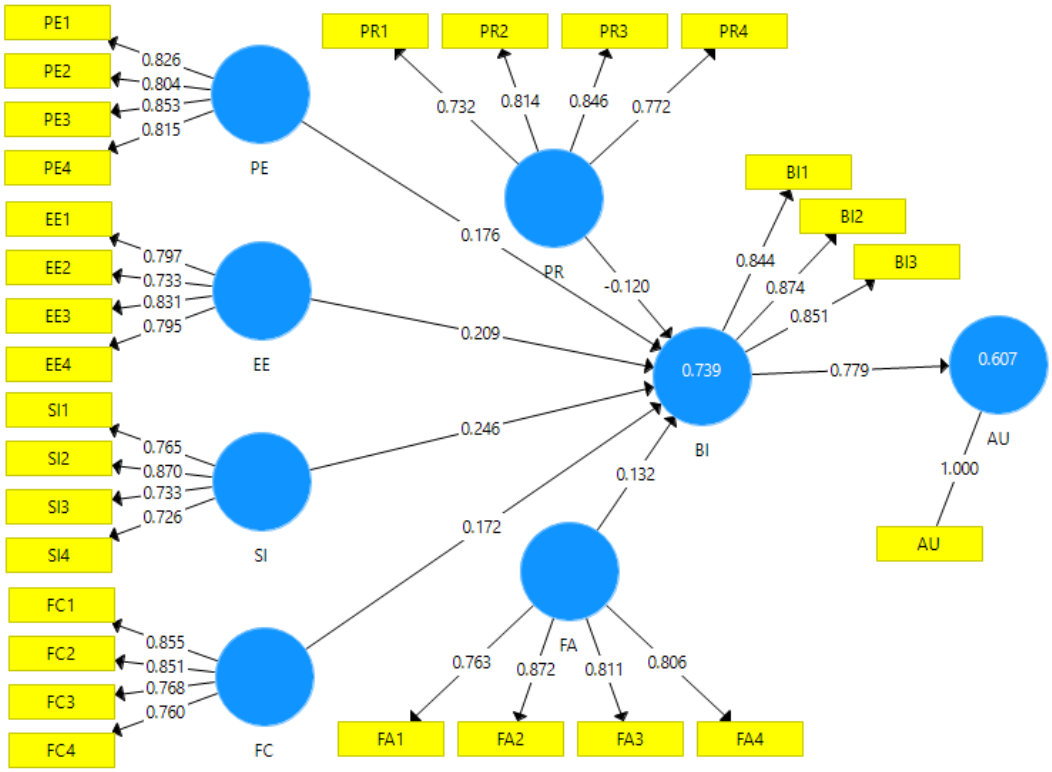

Figure 2: The Structural Model Test

Path Coefficient, T-statistics and R-squared Value

Table V indicates that the path coefficient and t-statistics are above their threshold values ie., 0.10 and 1.96, respectively at 5% significance level - for all six exogenous variables acting upon the endogenous variable.

The result implies that there is a direct and positive relation between PE, EE, SI, FC, PR and FA towards BI. From the analysis it is evident that BI leads to AU. Further R-squared value of the six constructs explains 73.90% of variance in BI and BI explains 60.70% of variance in AU. The result affirms that behavioural intention to use mobile banking can effectively result in actual usage, thus paving a stronger foundation for financial inclusion. The analysis suggests acceptance of Hypotheses 1 to 7.

Table 5
Path Coefficient, T Statistics and their Significance

Hypothesis	*Path*	*Path Coefficient*	*T Statistics*	*Results*
H1	PE → BI	0.176	2.371	Supported
H2	EE → BI	0.209	3.078	Supported
H3	SI → BI	0.246	3.859	Supported
H4	FC → BI	0.172	2.158	Supported
H5	PR → BI	0.120	2.162	Supported
H6	FA → BI	0.132	2.673	Supported
H7	BI → AU	0.779	15.739	Supported

Hypothesis 8a: PE, EE, SI, FC, PR, FA, BI, and AU vary according to Age, Income level, and Education level.

One Way ANOVA was applied to examine whether the behavioural intention differs with the demographic characteristics, ANOVA. To further detail, In the research PE, EE, SI, FC, PR, FA, BI, and AU are the metric data; and Age, Education level, and Income level are non-metric data. In order to test whether there are any significant differences between means of (more than two) groups within the population, we use One Way ANOVA.

Table 6
Results of Analysis of Variance (ANOVA)

Hypothesis	*F-statistic*	*Sig*	*Accept/Reject*
PE varies according to Age group.	2.259	.066	Reject
EE varies according to Age group.	3.751	.006	Accept**
SI varies according to Age group.	2.864	.026	Accept*
FC varies according to Age group.	2.186	.074	Reject
PR varies according to Age group.	2.971	.022	Accept*
FA varies according to Age group.	2.049	.091	Reject
BI varies according to Age group.	3.337	.012	Accept*
AU varies according to Age group.	2.711	.032	Accept*
PE varies according to Education level.	2.864	.039	Accept*
EE varies according to Education level.	2.383	.072	Reject
SI varies according to Education level.	1.631	.185	Reject
FC varies according to Education level.	1.546	.205	Reject
PR varies according to Education level.	0.537	.658	Reject
FA varies according to Education level.	2.654	.051	Reject
BI varies according to Education level.	3.055	.030	Accept*
AU varies according to Education level.	7.090	.000	Accept**
PE varies according to Income level.	2.761	.030	Accept*
EE varies according to Income level.	2.869	.025	Accept*
SI varies according to Income level.	3.985	.004	Accept*
FC varies according to Income level.	2.360	.056	Reject
PR varies according to Income level.	1.434	.226	Reject
FA varies according to Income level.	0.549	.700	Reject
BI varies according to Income level.	3.197	.015	Accept*
AU varies according to Income level.	4.746	.001	Accept**

** tested at 0.01 significance level
* tested at 0.05 significance level

Independent *t*-test was administered to find out whether the behavioural intention differed with gender.

Hypothesis 8b: PE, EE, SI, FC, PRr, FA, BI, and AU vary according to Gender.

Here, PE, EE, SI, FC, PRr, FA, BI, and AU are the metric data; and Gender (male or female) is non-metric data. So in order to test the hypothesis, i e whether there are any significant differences between means of (two) groups within the population, we use Independent Samples t-test.

Table 7
Results of Independent Samples t-test

Hypothesis	*F-statistic*	*Sig.*	*Accept/Reject*
PE varies according to Gender.	6.957	.009	Accept**
EE varies according to Gender.	0.492	.484	Reject
SI varies according to Gender.	10.126	.002	Accept**
FC varies according to Gender.	9.782	.002	Accept**
PR varies according to Gender.	0.027	.870	Reject
FA varies according to Gender.	0.000	.991	Reject
BI varies according to Gender.	3.213	.075	Reject
AU varies according to Gender.	0.026	.871	Reject

**Accepted @ 1% significance level.
*Accepted @ 5% significance level.

In order to test the hypothesis that the gender has an impact on PE, EE, SI, FC, PR, FA, BI, and AU, Independent Samples t-test is performed. Participants are divided into two groups based on their gender (Group 1: Male; Group 2: Female). There is a statistically significant difference in PE (F [146] = 6.957, p = .009); SI (F [146] = 10.126, p = .002); FC (F [146] = 9.782, p = .002) scores for the two gender groups. So the null hypotheses related to the impact of gender on PE, SI, and FC are rejected; and the corresponding alternative hypotheses are accepted.

When comparing the PE scores of males and females, the mean value of males (4.24) is statistically higher than the mean values of females (3.96). In the SI scores, the mean value of males (3.82) is statistically higher than the mean values of females (3.58). In the FC scores, the mean value of males (3.94) is statistically higher than the mean values of females (3.62).

5. FINDINGS AND SUGGESTIONS

The newly introduced exogenous variable in the study 'Familiarity' significantly (.132) explains the change in the endogenous variable 'Behavioural Intention'. Hence the actual usage level of mobile banking services can be improved by providing various awareness creation and training programs to the target group of financial inclusion aiming at familiarising the interface, terms, icons, and relevant services.

The combination of six variables - PE, EE, SI, FC, PR, and FA - explains 73.90 % of variance in BI. Also, the 60.70 % of change happens in AU is defined by BI. Since PE, EE, SI, FC, FA are positively related to BI to use mobile banking services, BI can be improved by adopting various strategies to increase the level of PE, EE, SI, FC, and FA variables. As PR is inversely related to BI, the strategies to reduce the PR are to be adopted to improve BI level. In its turn, BI would scale up AU also.

Demographic variables such as Gender, Age, Income level, and Education level is identified as influencing factors on PE, EE, SI, FC, PR, FA, BI, and AU. Gender influences PE, SI, FC; The Age influences on EE, SI, PR, BI and AU; Education Level impacts on EE, SI, PR, BI, and AU; Income Level influences on PE, EE, SI, BI, and AU. Instead of adopting general actions plans in a common spectrum, specific strategies aiming at particular segments of the target group would provide better result in the attempts to improve the usage level of mobile banking services.

6. CONCLUSION

In this research study, 'Familiarity' is proved to be a significant predictor of Behavioural Intention to use mobile banking. However, only 73.9% of the variance in Behavioral Intention, and 60.70 % of the variance in Actual Usage is explained in this study. There may be some other crucial factors, such as financial literacy, flexibility, habit, etc. which predicts the Behavioural Intention and Actual Usage; such factors are to be explored and validated through further empirical researches. Moreover, this research study has adopted UTAUT (Venkatesh, 2003) as its base model; but some researchers propose that the potential customer perspective can be measured in a better way by using UTAUT II (Venkatesh et. al., 2012) as the base model. Further empirical studies may be conducted in this arena.

Like any other research, this study has some limitations. Since the Convenient Sampling method is used, the sample selection bias may have been arise; also the selected samples may be non-representative in nature.

However, this study will help the policy makers and practioners in the field of banking industry to create a lesser cost platform for financial transaction (Ali Tarhini 2016), and in the field of financial inclusion to increase the usage level of formal financial services by adding mobile banking as a feasible model or channel.

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