

Behavioral Hindrance to Rapid Uptake of Mobile Money Services

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ABSTRACT: Indian Mobile Network Operators (MNO) are in preparation to launch a major scale up of the mobile money services (MMS) following the policy recommendations by the Mobile Money Association of India (MMAI) through the leadership of Dr. Nachiket Mor. This has led to drastic changes in mobile money service regulations, setting a level playing ground for the MNOs. Enabling regulations, well-developed mobile network, and a huge customer base is an opportunity for the Indian MMS to grow to the level of Mpesa in Kenya. However, research indicates that many mobile money launches rarely meet the set targets. They project their growth based on the existing mobile phone subscribers and on the Mpesa's strategy in Kenya. This leads to dismal performance in the first twelve months. To mitigate the potential investment losses, management team of the MNOs need to understand the factors that may hinder rapid uptake of mobile money services. This paper presents the findings of a survey on behavior influence on usage and acceptance of mobile money services both in India and in Kenya.

KEYWORDS: Mpesa, Mobile Money Service, Mobile Network Operator, India Mobile Money Association, Technology acceptance

1 BACKGROUND

1.1 MOBILE MONEY

This is the use of information and communication technologies (ICTs) to offer financial services to clients who would otherwise not be reached by the traditional branch-based financial services [10]. E-wallet is an example of Mobile Money Service (MMS) used to make peer-to-peer transfers and receive salaries. Some of the characteristics of a mobile money services includes transaction on an existing mobile network through Mobile Money Agents (MMA). Customers use an interface of basic mobile handsets.

1.2 MOBILE MONEY IN THE DEVELOPING COUNTRIES

Mobile money creates important changes in the lives of the poor. Relying solely on cash keeps many people excluded from the formal economy. Mobile money brings convenience to the doors of the poor since it is safe and readily available compared to cash [8],[9]. In developing countries like Kenya and Tanzania where Mobile Money is a success, the bottom of the pyramid feel included in national financial policy [6]. Apart from reducing dependency on cash, MMS has also opened an avenue for companies and institution to provide other vital financial services like the M-shwari, a savings and loan facility run on Mpesa platform in Kenya [8],[9].

Other countries with similar successful stories include Madagascar and Uganda [6]. In their survey, [8][9] indicates that mobile money accounts are twice more than the traditional bank accounts in these countries. In Kenya, 18 million people have Mpesa accounts whereas only seven million Kenyans have bank accounts, and two billion dollars is processed through Mpesa accounts every month [8],[9],[19]. India has advanced Mobile Networks and developmental similarities to Africa, which can be harnessed to open up MMS [18]. This would help trigger growth in the financial sector.

1.3 ENABLING REGULATION FOR MOBILE MONEY

All of the MMS in about 85 countries in the world thrive on enabling legislation, which allow non-bank businesses to run Mobile Money [10]. Some of these countries include Brazil, Kenya, Burundi, Zambia, Peru, Madagascar, Zimbabwe, Malaysia, Democratic Republic of Congo, Fiji, Uganda, Rwanda, amongst others [17]. However, in India the limiting factor is the regulatory barrier [16] causing masses at the base of the pyramid to depend on the cash.

1.4 NEW QUEST FOR MOBILE MONEY TRANSFER

In 2013, the Mobile Money Association of India (MMAI) submitted a recommendation paper to the Reserve Bank of India (RBI) Committee [7], providing evidence on the benefits of mobile money services. The proposal included regulatory reforms to provide a level playing ground and an enabling environment for mobile money deployments [18].

This resulted in the formation of a Committee on Comprehensive Financial Services for Small Businesses and Low-Income Households [7],[18]. The Reserve Bank of India (RBI) appointed Dr. Nachiket Mor as its chair [7] with a mandate to draw a clear, realistic and attainable road map for financial inclusion of the masses, and to review the current policies and approaches in order to eliminate hindrances to “financial inclusion and financial deepening” [4], p.131. The work of the Committee resulted in far-reaching effects especially where regulatory policy reforms are concerned.

1.5 EXCITEMENT OF MOBILE NETWORK OPERATORS

Plans are under way to invest heavily in the mobile money services following the proposal to eliminate policy barriers. Most Mobile Network Operators are expanding the existing infrastructure expecting massive and exponential growth in Mobile money customers. This assumption is based on the fact that Mpesa development in Kenya has been exponential yet Kenya does not have a well-developed mobile network compared to India [8],[18],[19].

Research indicates that many mobile money launches rarely meet the targets as set by the ambitious management team [5]. Strategic management teams tend to tailor their growth plan based on the Mpesa’s strategy in Kenya [13],[19] ignoring the behavioural differences between the two countries. This leads to dismal performance of mobile financial service in their first twelve months [15].

This research empirically determines factors that influence mobile money uptake in India in comparison with Kenya. The findings will enable the Mobile Network operators in India make informed choice on mobile money service scale up or adoption [18].

2 MATERIAL AND METHODS

The research was hinged to several theories as presented in the conceptual framework.

2.1 Conceptual Framework

a) Acceptance of Technology

User acceptance is the verifiable readiness by users to adopt technology for the correct purpose [30]. Lack of user acceptance is a major barrier to the success of innovation [30],[19]. Acceptance is the pivotal factor in shaping the future of any innovation. It is equally important to practitioners as it is for researchers to understand the reasons for accepting or rejecting innovation in information technology by a group of people [30]. This helps to determine better methods for “designing, evaluating, and predicting how users will respond” to the new technology [30], p195. For Mobile Money Services, acceptance level must be high for it to be a profitable venture for the MNOs.

b) Theory of Reasoned Action (TRA)

Theory of reasoned Action (TRA) aims to predict, explain, and influence human behaviour [20]. TRA is based on the following variables: Attitude towards the behaviour, intention, and subjective norms [21]. When looking at people, one needs to evaluate the degree to which performance of behaviour is positively or negatively valued [22]. The value on a behaviour results either in rejection or in acceptance of a product or service.

c) Technology Acceptance Model (TAM)

TAM is an extension of TRA model. It looks at the Perceived Usefulness (PU) and perceived ease of use (PEOU) [23] PU is the measure of the level of beliefs as to how useful a particular system is to one’s performance at work, whereas the PEOU deals with how a person feels that using the system requires no effort [24]. Mobile money service must be useful and requiring no effort when using it. The limitation of this model is that it provides limited guidance about how to “influence usage through design and implementation and the type of respondents” [24, p.720].

d) Theory of Planned Behaviour (TPB)

Theory of Planned Behaviour (TPB) addresses the limitations of the TRA model. TPB model incorporates the construct of perceived behavioral control (PBC) which influences both intention and behaviour [25]. It converts behavioural intentions into actions [25]. For example if there are intentions to use MMS, they result in actions.

e) Innovation Diffusion Theory (IDT)

In this model, an innovation is communicated through specified channels repeatedly among people of the same social beliefs [26]. Four elements of diffusion include Innovation, channels of communication, time frame and social setting [27]. The IDT theory empirically or otherwise does not explain how attitude evolves into either acceptance or rejection and how the innovations shape into this process [26], [25]

f) Decomposed Theory of Planned Behaviour (DTPB)

Decomposed theory of planned behaviour borrows from the theory of planned behaviour (TPB) and from innovation diffusion theory [25]. DTPB theory states that “attitude, subjective norm and perceived behavioural control” influences whether one will use technology or not [24]. The theory allows the decomposing of attitudes and control beliefs into several dimensions with the aim of arriving at a clear behavioural explanation. Clear understanding of the attitudes and beliefs of a group helps in knowing the trust level, hence determining the success of MMS. From TAM and TRA models’ perspective, trust is believed to have a positive effect on perceived usefulness, whereas the perceived ease of use has a positive influence on trust [25]

Trust is the antecedent of attitude, perceived behavioural control, and subjective norm. It increases the confidentiality of a business relationship and determines the quality of transaction between buyers and sellers [27]. Mutual trust and mutual influence between users and the technology innovation are highly correlated to each other [25]. The success of the MMS in India depends on the trust people have developed.

2.1 RESEARCH MODEL

TAM and DTPB states that the understandings of technology and trust issues are critical in determining behavioural intention to use MMS technology. An extension of the TAM model with DTPB would be a better way to understand the acceptance behaviour towards MMS and this would provide precise explanation that can be used to examine the problem and effectively improve usage and promote collaboration among the professionals.

The combination of the decomposed TPB model and the TAM model results in a model is that is taken as the theoretical basis for determining and elucidating factors that affect MMS technology uptake by the construction professionals in Qatar. According to DTPB model, intention to perform behaviour determines the frequency of the behaviour [24],[25],[26],[27]. The research model focuses on the behaviour towards the MMS technology. From the DTPB models, the research suggests to

look at the behaviour from its four predicting factors: attitude toward the behaviour, subject norm, perceived behavioural control (PBC), and trust.

2.2 RESEARCH QUESTIONS

The research questions are as follows:

1. What are the factors influencing adoption of Mobile money services by Indian and Kenyan customers?
2. What is the role of social influence in acceptance of the mobile money services?

Research model is as shown in figure 1.

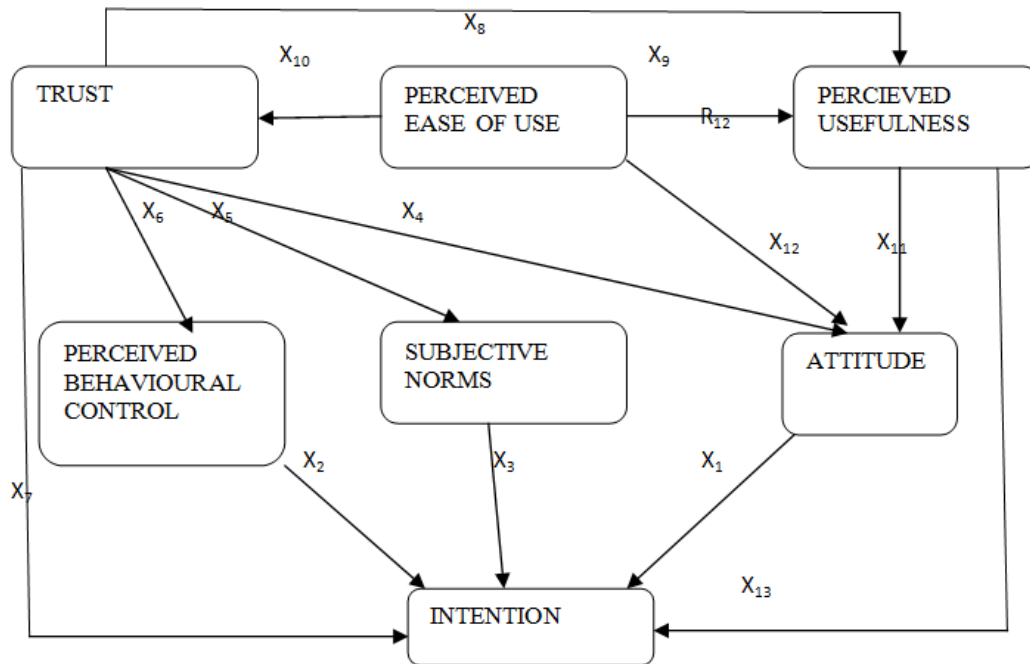


Fig. 1. Research Model

2.3 HYPOTHESES

Hypotheses are constructed based on the research questions, the literature review, and conceptual framework. X1 to X13 represents hypotheses relating the behavioral constructs.

3 METHODOLOGY

3.1 RESEARCH PURPOSE AND STRATEGY

This research was descriptive and deductive with a quantitative approach. The main research strategy employed was survey, which answered the question what. Samples of target populations in the two countries were done.

The population of interest was dwellers in Nairobi, Kenya and the dwellers in Chennai India. Being interested in the concept of intention, the respondents were those with mobile handsets, but without or with little mobile money transaction experienced. The sampling frame included rural, low and high-class dwellers both in Nairobi, Kenya and in Chennai India. The Survey took place between the months of January to March 2014

3.2 SAMPLING TECHNIQUE

The appropriate technique to help find barriers to MMS adoption was taken as the probability-sampling method.

3.3 MEASUREMENT OF CONSTRUCTS

Appropriate research constructs based on the extended literature review was developed. The following table1 presents constructs and their corresponding measurement used in the questionnaires.

Table 1: Construct Definition

Construct	Definition
Attitude	Positive or negative feeling about MMS
Subjective Norms	Degree of perception of how important others believe they should use MMS
Facilitating Conditions	Degree to which a person believes that the required support use of MMS exists
Self Efficacy	Degree to which a person's self confidence in their ability to use the MMS
Perceived Ease of use	Degree to which a person believes that MMS would be free of effort
Trust	Trust includes ability, benevolence and integrity of the MMS
Intention	A person's readiness to adopt MMS

4 RESULTS

4.1 DATA COLLECTION

Samples were taken randomly from the populations with experience and from those with little or no experience in MMS usage. Data was collected from different parts of Nairobi and Chennai. The samples were categorized into slum dwellers (A), rural dwellers (B), and suburb dwellers (C). The questionnaires were distributed as follows. A=100, B=100 and C=122 in the two countries. The total number of distributed questionnaires was 322 out of which 82 were incomplete in Chennai and 50 were incomplete in Nairobi. The sample sizes for this study was 240 in India and 272 in Kenya.

4.2 DATA ANALYSIS

This research employed partial Least Squares (PLS) to perform data analysis.

For India

Table 2: Chennai Data Summary

Variable	Classification of variable	Frequency	Percentage
Gender	Male	200	83.3%
	Female	40	16.7%
Age	Less than 20 years	2	0.83%
	Between 20-30 years	158	65.8%
	Between 30-40 years	76	31.7%
	Between 40-50 years	3	1.25%
Marital status	More than 50years	1	0.41%
	Married	95	39.6%
Education	Single	145	60.4%
	Diploma	17	7.1%
	Intermediate College	26	10.8%
	Bachelor	114	47.5%
Income	Master/PhD	83	34.6%
	Less than ₹2000/pa	12	5.0%
	Between ₹2000-₹4000	58	24.2%
	Between ₹4000-₹6000	67	27.9%
	Between ₹6000-₹8000	52	21.7%
	Between ₹8000-₹10000	10	4.2%
	More than ₹10000	41	17.1%

From table 2 the result shows than a majority of the respondents are male (83.3%) and between 20-30 years old (65.8%). 60.4% are single, 47.5% have a bachelors. A sample population of 27.7% has income between £4000-£6000. Seventeen percent of those with high level of education and are above 30 years old earn more than £10000 per month.

For Kenya

Table 3: Nairobi Data Summary

Variable	Classification of variable	Frequency	Percentage
Gender	Male	210	77.2%
	Female	62	22.7%
Age	Less than 20 years	5	1.83%
	Between 20-30 years	182	66.9%
	Between 30-40 years	72	26.5%
	Between 40-50 years	10	3.67%
	More than 50years	3	1.1%
Marital status	Married	120	44.1%
	Single	152	55.8%
Education	Diploma	40	7.1%
	Intermediate College	36	14.7%
	Bachelor	143	52.5%
	Master/PhD	53	22.1%
Income	Less than £2000/pa	30	11.02%
	Between£2000-£4000	54	19.8%
	Between £4000-£6000	122	44.9%
	Between £6000-£8000	35	12.9%
	Between £8000-£10000	27	9.92%
	More than £10000	34	12.5%

From table 3 the result shows than a majority of the respondents are male (72.2%) and between 20-30 years old (66.9%). 55.8% are single, 52.5% have a bachelors. A sample population of 44.9% has income between £4000-£6000. Twelve percent of those with high level of education and are above 30 years old earn more than £10000 per month.

4.3 RESULT AND HYPOTHESIS TEST

Table 4 and Table 5 below show the result of testing the research model using PLS analysis. Estimated path coefficients are listed with their respective t-values. Most coefficients in the two countries are significant at 97% significance level, providing strong support for the hypotheses. The result shows the appropriateness of the TPB, TAM and TDTP models in explaining individual behaviour (ICSMPS & Kruse, 2013). The results also support the links for the models representing effects of trust on intention and adoption mobile money services

For India

Table 4: Result and Hypothesis Test for India

Hypothesis	Effects	Path Coefficient	T-statistics	Remarks
Hyp1	Att on Int	0.390	4.9880	Supported
Hyp2	PBC on Int	-0.017	-0.6271	Not supported
Hyp3	SC on Int	0.120	2.0541	Supported
Hyp4	Tr on Att	0.156	3.3764	Supported
Hyp5	Tr on PBC	0.372	7.6993	Supported
Hyp6	Tr on SC	0.189	2.7045	Supported
Hyp7	Tr on Int	0.131	2.1760	Supported
Hyp8	Tr on PU	0.203	4.0311	Supported
Hyp9	PEU on PU	0.568	12.9295	Supported
Hyp10	PEU on Tr	0.385	7.4461	Supported
Hyp11	PEU on Att	0.154	2.1761	Supported
Hyp12	PU on Att	0.543	7.1568	Supported
Hyp13	PU on Int	0.313	3.7022	Supported

For Kenya

Table 5: Result and Hypothesis for Kenya

Hypothesis	Effects	Path Coefficient	T-statistics	Remarks
Hyp1	Att on Int	0.387	4.9850	Supported
Hyp2	PBC on Int	-0.019	-0.6273	Not supported
Hyp3	SC on Int	0.118	2.0537	Supported
Hyp4	Tr on Att	0.152	3.3760	Supported
Hyp5	Tr on PBC	0.371	7.6990	Supported
Hyp6	Tr on SC	0.182	2.7055	Supported
Hyp7	Tr on Int	0.132	2.1759	Supported
Hyp8	Tr on PU	0.213	4.0321	Supported
Hyp9	PEU on PU	0.635	12.9364	Supported
Hyp10	PEU on Tr	0.392	7.4470	Supported
Hyp11	PEU on Att	0.150	2.1756	Supported
Hyp12	PU on Att	0.537	7.1559	Supported
Hyp13	PU on Int	0.325	3.7032	Supported

4.4 RESULT ANALYSIS

From the table 4, the results for India show that the;

- (i) Intention to use MMS is predicted by attitude ($\beta = 0.390$, $p < 0.01$), subjective Norms ($\beta = 0.120$, $p < 0.05$), trust ($\beta = 0.131$, $p < 0.05$), and perceived usefulness ($\beta = 0.313$, $p < 0.01$).
- (ii) Attitude to use MMS is predicted by trust ($\beta = 0.156$, $p < 0.01$), perceived usefulness ($\beta = 0.543$, $p < 0.01$), and perceived ease of use ($\beta = 0.154$, $p < 0.05$).
- (iii) Perceived usefulness is predicted by perceived ease of use ($\beta = 0.568$, $p < 0.01$), and trust ($\beta = 0.203$, $p < 0.01$).
- (iv) Trust is predicted by perceived ease of use ($\beta = 0.385$, $p < 0.01$).
- (v) Trust has a positive effect on attitude ($\beta = 0.156$, $p < 0.01$), subjective norm ($\beta = 0.189$, $p < 0.01$), and perceived behavioral control ($\beta = 0.372$, $p < 0.01$).

(a) Intention towards MMS

- (i) The intention to use MMS is jointly predicted by attitude ($\beta = 0.390$), subjective Norms ($\beta = 0.120$), trust ($\beta = 0.131$), and perceived usefulness ($\beta = 0.313$). These variables explain 55.5% of the variance on intention to use ($R^2 = 0.555$ coefficient of determination). This shows how good and strong the explanatory power of models of intention. If one

compares the results with the previous TPB based studies in IT acceptance, the explanatory power of the current research model for behavioral intention to the use is the higher than the given values of $R^2=0.42$.

(ii) Attitude ($\beta = 0.390$) has a significant effect on intention and thereby supporting hypothesis 1. Attitude with the coefficient of 0.39 has the strongest effect. This shows the important role of an individual's attitude in driving their intentions towards adoption of MMS. This concurs with Pratkanis who proposed that attitude strongly affects intention [28].

(iii) The path between trust and intention is significant ($\beta = 0.130$), hence supports hypothesis 7. This finding still supports Pratkanis who proposed a significant relationship between trust and behavioral intention [28].

(iv) The path between usefulness and intention was found to be significant ($\beta = 0.313$) hence supporting hypothesis 13. This is consistent with the findings of [29], [28] who proposed significant correlation between intention and perceived usefulness.

(v) The path between subjective norms and intention was found to be significant ($\beta = 0.120$) hence supporting hypothesis 3. The formative measures considered interpersonal and external influence, family, friends and media. Media and family influences were significant, but the friends influence was minimal. This agrees with the findings by Fiske [29].

(vi) The path between perceived behavioral control was found not to be significant ($\beta = -0.017$) hence rejecting hypothesis 2. These findings are inconsistent with those of Fiske who reported significant relation between behavioral control and intention [29].

(b) Attitude towards MMS

(i) The attitude to use MMS is jointly predicted by trust ($\beta = 0.156$), perceived usefulness ($\beta = 0.543$), and perceived ease of use ($\beta = 0.154$) explaining the fifty-five percent variance. The path between perceived usefulness and attitude was found to be significant ($\beta = 0.543$), hence supporting hypothesis 11. This is consistent with other studies by [28] which reported a significant relation between usefulness and attitude. Perceived usefulness has the strongest path coefficient of 0.543 emphasizing the important role of an individual perception of the usefulness in shaping their attitudes.

(ii) The path between perceived ease of use and attitude was found to be significant ($\beta = 0.154$) hence supporting hypothesis 11. This is consistent with studies by [29] who reports a significant relation between perceived ease of use and attitude.

(iv) The path between trust and attitude was found to be a significant ($\beta = 0.156$) hence supporting hypothesis 4. The result supports findings of [29], who found a significant relation between trust and attitude.

(c) Perceived Usefulness

(i) Perceived usefulness is predicted by perceived ease of use ($\beta = 0.568$), and trust ($\beta = 0.203$) giving a total variance of 44.5%. The path between perceived ease of use and perceived usefulness was found to be significant, hence supporting hypothesis 9. This is consistent with finding by Myers & Kwon (2013) which also supports the trust relation in the TAM model.

(ii) The path between trust of use and perceived usefulness was found to be significant ($\beta = 0.203$) hence supporting hypothesis 8. This supports the findings by Venkataraman [14].

When table 5 for result and hypothesis test for surveys done in Kenya is analyzed, the result shows similar characteristics with that of the research sample in India. There is a slight deviation in actual results but the overall summary shows a similar behavioral inclination of Kenyan and Indian mobile money users towards acceptance and usage of the technology.

5 DISCUSSION

This research acted to confirm that irrespective of the geographical location, customers' behaviour is one of the most influencing factors for the uptake of a new product. Any Mobile network operator gearing to expand or launch MMs need to consider the following in relation to behavior.

5.1 ADOPTION AND USAGE OF MOBILE MONEY

Mobile Money is a service that has two types of clients: customers and users [1]. Failure to distinguish between adoption and usage states leads to misrepresentation of facts. For example, a Mobile Network Operator looks at 2 million accounts opened in 4 four months but fails to analyze how many of these accounts are performing. Since performance is directly related to the revenue, a player with high percentage of non-performing account holders may not survive [1]. Indian Mobile money Operators should have a clear strategy not to just rush for customers and end up with nonperforming clients.

5.2 KNOWLEDGE OF PRODUCT LIFE CYCLE

This is the “birth and death” of a product or a service [2]. The cycle includes four main phases – introduction, growth, maturity, and decline [2]. At introduction the product is unfamiliar to the majority of customers hence they become cautious about it [11] but at growth level, customers become more familiar with the product resulting in increased adoption. At maturity a high number of customers, stiff competition, and many incentives distinguishing one player from another come into play [11]. The last level is the decline where saturation of the product and customers increasingly become disinterested and start looking for a more superior product [11]. The Indian MNO must understand the level at which Mobile Money Sector is at to make an informed decision.

5.3 TECHNOLOGY DIFFUSION CURVE

Product Diffusion theory helps one to understand the customers’ uptake behavior of a given product or service over a period [6]. Adoption of the new product falls into five categories including Innovators (2.5% of the market), Early Adopters (13.5%), Early Majority (34%), Late Majority (34%) and the Laggards marking sixteen percentage of the market.

Mobile money operators must exercise caution on using the behaviour of innovators and early adopters to project future performance [12]. For example, WIZZIT in South Africa had an exponential mobile money customer growth within the first three years. However, the trend suddenly changed to a modest growth, which fell below its projections [3]. This is because of the innovators. With the knowledge that different sections of adopters respond differently to a new product or service, Indian mobile money operators have an upper hand in planning for expansion or a new launch.

6 CONCLUSIONS

In conclusion, three important recommendations for the mobile operators gearing for the liberalization of the Mobile Money sector in India include:

6.1 CAPITALIZE ON THE FIRST TWO SEGMENTS

In a country like India where mobile money services are relatively scarce, firms have to concentrate on the early adopters and innovators [6]. Since the innovators and early adopters go in for innovative products, the mobile money services must invest heavily in ensuring the products offered meet customers’ taste. Mobile companies also need to guard their market by responding quickly to the needs of their customers lest a competitor with superior products snatch them away.

6.2 USE TRIALS TO DEVELOP CUSTOMER CONFIDENCE AND EARN TRUST

Since MMS deals with money, new customers are concerned with reliability, and safety of the service and the providers. To build the confidence and trust in the mobile money services, provider companies must offer trials to potential customers [13]. These may include free registration, zero transaction charges, and free airtime top up for customers during the pilot period [13]. For example, in 2006 the Mpesa pre-launch strategy in Kenya included free registration of five hundred customers in the three neighboring districts to Nairobi [6]. Pilot customers had a privilege of carrying out transactions free of charge for a couple of months. This strategy worked as many people sought to register as Mpesa users [19].

6.3 UNDERSTAND THE TECHNOLOGY CURVE OF MOBILE MONEY SERVICE

It is important for the mobile operators in India to appreciate the stage where this innovation is at on the technology adoption curve [6]. Companies must analyze customer types to determine the category and the fraction actively using the services [6].

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