

## **Effect of Inherent Innovativeness and Consumer Readiness on Attitudes to Mobile banking**

### **Abstract**

Despite the strong evidence that many consumers relish their experience with mobile banking, others indicate that some segments may not be comfortable with these emerging digitized platforms due to certain inherent personal traits. Drawing insights from the socio-psychology and innovation/SSTs adoption literature, this paper tested a structural model with inherent innovativeness as an antecedent variable, and consumers' attitude to M-banking, as a mediator to their future usage intention. The moderating effect of consumer readiness on the hypothesized relationship between consumers' attitudes and intention to use mobile banking was also examined. The model was tested on survey data from 720 respondents from the United Kingdom (UK).

Findings show that inherent innovativeness significantly explain attitudes to mobile banking. There was, however, mixed outcomes concerning the effects of three dimensions of consumer readiness on the link between attitudes and intention to use mobile banking. The results show that only ability exert a positive and a significant effect on the examined relationship. The effects of *motivation* and *role clarity* seemed insignificant. The findings from this paper can help retail bank managers improve their channel and promotional decisions in order to enhance the service experience of relevant segments.

**Keywords:** Inherent Innovativeness, attitudes, consumer readiness, mobile banking, retail banking, self-service technologies, United Kingdom

## **INTRODUCTION**

Since the beginning of the millennium, there have been outstanding growth and developments in technology-based service delivery channels in various service industries (Quinn et al, 2016; Thakur and Srivastava, 2014; Oh et al, 2013; Wang et al, 2012 and 2013; Wessels and Drennan, 2010; Reinders et al, 2008; Laukken and Pasanen, 2008). In particular, the retail banking sector has seen a significant transformation following innovative developments in mobile telephony and internet technology. These recent advancements in mobile technologies have spawned a growing adoption of Mobile Banking (or M-banking). Consequently, a number of studies have been dedicated to understanding the factors which facilitate or inhibit the adoption of M-banking and other Self-Service Technology (SST) platforms across many sectors. Yet, despite the strong empirical evidence which suggests that many consumers relish their experience with SST platforms, others indicate that some consumer segments may not be comfortable with these emerging digitized platforms (Thakur and Srivastava, 2014; Chemingui and Iallouna, 2013; Reinders et al, 2008; Laukken and Pasanen, 2008; Nilsson, 2007).

Consequently, some researchers have suggested that varying consumer attitudes towards SSTs and their use, may be due to consumer resistance

(Chemingui and lallouna, 2013), and differences in intrinsic factors such as inherent innovativeness (Meuter et al., 2005; Dabholkar and Bagozzi, 2002). Regrettably, to date, very little is known regarding ways in which consumers' *inherent traits* may affect their attitudes towards emerging SST platforms such as mobile banking.

We attempt to address this gap by presenting a conceptual framework that integrates the potential role which inherent innovativeness may play within the broad attitude-behaviour model for technology adoption (Ajzen, 1991; Davies, 1989). Specifically, we employed the theory of individual inherent innovativeness (Midgley and Dowing, 1978; Hirschman, 1980) as an antecedent of consumers' attitudes towards M-Banking use. In addition, we explored the potential moderating effect of consumer readiness (Meuter et al, 2005) in the relationship between attitudes towards and intentions to use mobile banking.

From a practitioner's perspective, research insights from this study can inform strategic management decisions relating to the segmentation, promotion and channel strategies of banks. For example, insights can help in the design of appropriate multichannel strategies for various customer groups, which can help to enhance customers' experience with specific delivery channels (See Salomann et al, 2006; Wang et al, 2013).

The structure of this paper is as follows. The next section presents the literature review, conceptual perspective and hypotheses. Following this, the methods

employed to carry out this research are described. The final section presents the findings, conclusions, implications and limitations of the study.

## **LITERATURE REVIEW**

### ***SSTs and Mobile Banking***

Self-service technologies have been described as "technological interfaces that enable customers to produce a service independent of direct service employee involvement" (Meuter et al, 2000, p.50). In retail banking, examples of these include Automatic Teller Machines (ATMs), internet banking, telephone banking, ticket machines for queuing in branches, and recently, mobile banking (Thakur and Srivastava, 2014; Hanafizadeh et al, 2014; Sohail and Al-Jabri, 2014; Al-Jabri and Sohail, 2012; Puschel et al., 2010; Wessels and Drennan, 2010; Laukkanen and Pasanen, 2008; Suorantia and Mattila, 2004). Arguably, during the last decade, mobile banking has emerged as a key SST platform given the significant growth in the adoption of mobile technologies across both developed and developing economies.

The term, mobile banking, has been defined as banking transactions using mobile devices such as cell phones, PDAs (Personal Digital Assistants), smart phones and other devices (except for laptops) to access financial or banking services (Lee and Chung, 2009). Generally, M-banking platforms allow bank customers to carry out financial operations remotely through their mobile phones. These operations include balance inquiries, checking account history, card and cheque book ordering, loan applications, credit portfolio and securities monitoring, exchange rate and stock exchange monitoring, recharging phone

accounts, bill payments and account-to-account money transfers at the national and international level (Chemingui and lallouna, 2013).

Over the last decade, there has been growth in the investment and use of M-banking. However, the rate of adoption of M-banking has varied by consumer segments. Consequently, a number of studies have focused on identifying the various factors which affect the adoption of M-banking and other forms of SST innovations (See Thakur and Srivastava, 2014).

### **Determinants of Attitudes to Innovation Adoption**

To date, the varied literature on the adoption of innovation has been underpinned by attitude-behaviour models such as the *Theory of Reasoned Action (TRA)* (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975); *Technology Adoption Model (TAM)* (Davis, 1989), *Innovation Diffusion Theory (IDT)* (Rogers, 2003); and *Theory of Planned Behaviour* (Ajzen, 1991). *Attitudes* have generally referred to the cognitive beliefs, values and general orientation of consumers to a new technology or an innovation. According to the attitude-behaviour theories (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975), consumers attitude, along with other personal and situational factors, are immediate determinants of their intentions to perform a behaviour. A number of empirical studies also suggest that the adoption of new technologies or SSTs, is the outcome of complex interrelationships among key variables relating to innovation characteristics, individual differences, and situational variables (Thakur and Srivastava, 2014; Wessels and Drennan, 2010; Meuter et al, 2005; Dabholkar and Bagozzi, 2002),

## **Effects of Innovation Characteristics**

Earlier research efforts on the adoption innovation were mainly premised on the conceptual foundation that the characteristics of innovation and individual factors are important predictors of consumers' acceptance and adoption of new technologies (See TAM Model by Davis, 1989). Based on this model, a number of empirical findings, suggest that the perceived usefulness (PU) and perceived ease of use (PEOU) of technological innovations are positively related to behavioural intentions to adopt SSTs such as mobile banking (Juwaheer et al, 2012; Akturan and Tezcan, 2012; Tobbin, 2012). Similarly, the outcomes from other studies indicate that innovation attributes such as *relative advantage*, *ease of use*, and *compatibility* are the most salient factors in explaining consumers' adoption of internet and mobile technologies (Dineshwar, 2013; Al-Jabri and Sohail, 2012; Koenig-Lewis et al. 2010; Papiés and Clement 2008; Park and Chen 2007; Vijayasathy, 2004).

## **Effect of Personal Factors**

Aside from the studies which focused on the effects of innovation characteristics, others have explored the potential impact of some individual variables in explaining innovation adoption. These include surface personal factors such as *demographics* (gender, age, income levels) (Onyia and Tagg, 2011; Laukkanen and Pasanen, 2008; Nilsson, 2007; Laforet and Li, 2005; Mattila, 2003). Overall, the results from these studies indicate that the early adopters of M-banking were relatively young (between the ages of 25 and 34), average income earners, and white-collar urban workers. These findings, are

by no means, conclusive given the dynamic and accelerated change in consumer access to mobile phones and other forms internet technologies during the last decade (Quinn et al, 2016; Thakur and Srivastava, 2014; Al-Jabri and Sohail, 2012 ). In addition, other researchers have called for a need to move beyond the analysis of superficial demographic characteristics to a focus on deeper personal factors, as these are considered to be at the heart of consumer behaviour (Lin and Chang, 2011; Dabholkar and Bagozzi, 2002). These deeper personal factors include intrinsic motivations, psychographics (See Thakur and Srivastava, 2014; McMellon et al, 1997; Meuter et al, 2005) and inherent personal traits.

Insights from the broad literature render support for the view that individuals with high perception of behavioral control, a psychographic variable, may be more predisposed to take personal initiative to adopt new SSTs than those with low behavioral control. *Perceived behavior control* (Ajzen, 2002), refers to the extent to which one believes he/she has control over things that happen to him/her rather than attributing such happenings to external forces. Moreover, *need for interaction*, a psychographic variable, refers to the importance of human interaction to consumers in service encounters (Dabholkar, 1996). The view is that consumers with high need for interaction tend to prefer accessing services with the assistance of service employees rather than through SSTs (Meuter et al, 2000 and 2005; Dabholkar, 1996).

Despite some attempts to explain the effects of deeper personal factors (Thakur and Srivastava, 2014; Meuter et al, 2005; Parasuraman, 2000; McMellon et al,

1997; Barczak et al, 1997; Dabholkar, 1996; Olshavsky and Spreng, 1996), the potential role that personality traits play in the adoption of new technology has received limited research attention. This is considered an important omission given that variations in personal traits are perceived to be critical determinants of attitude formations and behavioural intentions.

In particular, one personal trait which has been identified as an important determinant of SST adoption is the concept of *inherent innovativeness* (Dabholkar and Bagozzi, 2002) or personal innovativeness (See Agarwal and Prasad, 1998; Thakur and Srivastava, 2014). The concept of inherent innovativeness has been defined as "the degree to which an individual is receptive to new ideas and makes innovation decisions independently of the communicated experience of others" (Midgley and Dowlings, 1978, cited in Dabholkar and Bagozzi, 2002, p.188).

Dabholkar and Bagozzi (2002), identified that individual variables such as *inherent innovativeness*, along with other personal factors such as *self-efficacy* (Bandura, 1997; Wang et al., 2013), *self-consciousness* and *need for interaction* with employees, moderates attitudes and intentions towards SSTs. In a related and more recent study, Thakur and Srivastava (2014), who conceptualised the construct as an endogenous variable, also identified that personal innovativeness exerts a significant effect on intentions to use mobile banking. However, to date, there is very limited knowledge regarding other conceptual ways in which the construct may explain the adoption of mobile banking, particularly, as an exogenous or antecedent variable.



## **Situational Factors**

Other researchers have attempted to explain SSTs adoption by examining the potential ways in which situational factors may interrelate with relevant determinants such as innovation characteristics and personal factors, to determine consumers' attitudes to SSTs. For example, the effects of contextual variables such as 'voluntariness'/'Forced used' (Liu, 2012; Brown et al, 2002; Agarwal and Prasad, 1997); 'waiting time' (Oh et al, 2013; Dabholkar and Bagozzi, 2002); 'forced use' of SSTs (Reinders et al, 2008); 'past experience' with SSTs (Wang et al, 2012); complexity of SSTs (Oh et al, 2013), and 'adoption readiness' (Thakur and Srivastava, 2014), have all been examined. Overall, the outcomes from these studies suggest that situational factors are critical determinants of innovation adoption. This is because the different contexts in which consumers experience a service, may encourage or discourage them to use various SSTs. Thus, the contention is that some situational variables may moderate or mediate the relationships among established innovation adoption variables (Meuter et al, 2005).

One of these relevant situational variables is 'consumer readiness', which has been observed as an important predictor/mediator of SST adoption (Meuter et al, 2005). Meuter and his colleagues conceptualize the construct as consisting of *role clarity*, *motivation*, and *ability*. In addition, the authors hold that this construct has important implications for influencing SST adoption. This is because, unlike personal factors (e.g. age, sex, traits, etc.), aspects of

consumer readiness are relatively easy to manipulate through managerial interventions before and after the introduction of an innovation.

In an empirical study involving patients' use or non-use of an Internet-based System and Interactive Voice Response (IVR) for re-ordering prescription drugs, Meuter et al (2005) identified consumer readiness variables (role clarity, motivation and ability), as significant mediators between innovation characteristics, individual differences and the likelihood of consumers' trial of SSTs. Similarly, other studies suggests that *technology readiness*, a related construct to consumer readiness, has a positive moderating effect on consumers' attitude to SSTs (see Lin and Chang, 2011). Thus, overall, it can be argued that there is strong evidence in the literature supporting the critical role of situational variables in explaining SST adoption. It is therefore important for additional studies to explore other ways in which relevant situational factors interrelate with other theoretically plausible predictors of innovation adoption, to expand our understanding of consumers' attitude to SSTs. Against the background of the foregoing review, the next section explains the conceptual perspectives and the resulting hypotheses examined in this research.

## **CONCEPTUAL PERSPECTIVES AND HYPOTHESES**

### **Attitude-behaviour Theories**

As noted earlier on, the broad literature on innovation adoption has been underpinned by traditional attitude-behaviour models (Ajzen, 1991; Davis, 1989; Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) and innovation diffusion theory (Rogers, 2003). The literature review, however, highlights the

limited attention which has been given to examining the potential ways in which personal traits, such as inherent innovativeness, may account for significant variations in consumers' attitudes to innovation in general and M-banking adoption in particular.

Going beyond the traditional framework for researching the determinants of innovation adoption, the proposed conceptual framework emphasises the key role of inherent innovativeness as an antecedent of M-banking adoption. It builds on the previous research on SST adoption (Meuter et al, 2005 & Dabholkar & Bagozzi, 2002). In addition, the foundations of the conceptual model (Figure 1) draws extensively from the socio-psychology literature, regarding the role of personal traits as important determinants of consumer behaviour (see Engel et al, 1969). Specifically, we employed the concept and theory of inherent innovativeness (Midgley and Dowing, 1978; Hirschman, 1980) as an antecedent of mobile banking adoption. We also explore the potential moderating effects of consumer readiness (Meuter et al, 2005), between attitudes towards and intentions to the use of mobile banking. In addition, based on insights from the literature, we integrate other personal variables relating to demographic and psychographic factors as control variables in order to isolate the unique contribution of the predictor variable, inherent innovativeness. The key variables in the conceptual model and the proposed hypotheses are explained and discussed in the next.

**(Fig. 1: about here)**

### **Antecedent: Inherent Innovativeness**

Even though other individual traits could potentially affect how consumers respond to M-Banking, the current research focused on inherent innovativeness as an antecedent predictor because it is perceived to be a stable personal trait which affects innovation behavior independent of external influences (See Midgley and Dowlings, 1978). Thus, this construct can be viewed as an intrinsic and a relatively more stable trait which cannot be easily manipulated. Some researchers suggest that this construct is different from related terms such as *personal innovativeness*, which has been used to describe different categories of innovation adopters over time (see Rogers 2003). The view is that personal innovativeness captures the time taken by individuals to adopt an innovation. Thus, the contention is that it may be influenced by the experiences of others over time (See Flynn and Goldsmith, 1993). However, inherent innovativeness is considered as a relatively enduring and more stable innate trait.

In a previous study, Dabholkar and Bagozzi (2002) conceptualized the construct as a moderator within an attitudinal model of SST adoption. However, in the current study, we conceptualized it as a key antecedent predictor variable rather than as a moderator. We contend that treating the construct as a predictor, is a plausible conceptualization in view of the theory that inherent traits are deterministic of human and consumers' behaviour (Engel et al, 1969).

Specifically, our conceptual perspectives are informed by insights from the literature on innovation adoption (Midgley and Dowing, 1978; Hirschman, 1980) and socio-psychology, which suggest that this construct exerts a significant effect on attitudes towards innovation adoption. Thus, we argue that the perceived level of inherent innovativeness in consumers will be significantly linked to their attitudes towards M-banking. Consequently, the first hypothesis was advanced as follows:

**Hypothesis 1:** Inherent innovativeness exerts a direct and a significant effect on attitudes to mobile banking.

**Mediator: Attitudes to M-Banking**

Based on the attitude-behaviour model (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) and SSTs adoption literature (Wang et al, 2013; Wessels and Drennan, 2010; Meuter et al, 2005; Dabholkar and Bagozzi, 2002), consumers' attitudes are perceived as immediate determinants of their intention to use an innovation. Drawing insights from this theory, it was expected that consumers' attitudes towards M-banking, would mediate the hypothesized relationship between inherent innovativeness and intention to use that service platform. Generally, intention to use an innovation relates to an individual's future plans of continuing to use a service or a product.

Even though the link between consumers' attitudes, intentions and the ultimate enactment of the actual behavior is well established in the literature, the extent to which attitudes mediate the hypothesized link between inherent

innovativeness and future usage intention, has not been directly tested. Consequently, the second hypothesis was advanced as follows:

**Hypothesis 2:** Consumers' attitude to mobile banking mediates the relationship between inherent innovativeness and the intention to use mobile banking.

### **Moderator - Consumer Readiness**

According to Meuter et al (2005, p.64), 'consumer readiness' is a condition or state in "which a consumer is prepared and likely to use an innovation for the first time". The authors conceptualize the construct as consisting of *role clarity*, *motivation*, and *ability*. Ability relates to the possession of the required skills and confidence to carry out a task, while motivation refers to a desire to receive the rewards associated with using the SST. Role clarity reflects consumers' knowledge and understanding of what to do to effectively in order to use the SST.

It is instructive to point out that even though consumer readiness, as used in this study, appears similar to related concepts such as 'adoption readiness' (Thakur and Srivastava, 2014), the conceptual domains are different. This is because adoption readiness is viewed as a second order construct with four dimensions - These are perceived usefulness, perceived ease of use, perceived importance of others opinion regarding use of a system (SI), and perceptions regarding the availability of supporting infrastructure to use a system (FC) (see Thakur and Srivastava 2014, p.372).

Past research show that consumer readiness variables (role clarity, motivation and ability), significantly mediate the link between some individual differences (inertia, technology anxiety, need for interaction, previous experience, and innovation trial). The authors also note that, compared to other group of predictors (innovation characteristics and individual difference variables), consumer readiness variables are relatively stronger predictors of intention to trial an innovation (Meuter et al, 2005, p.78). Therefore, it is important to further explore other conceptual ways in which the construct influences innovation adoption.

To improve our understanding about the various ways in which consumer readiness influences adoption of innovations, we conceptualized it as a moderator between consumers' attitudes and intentions to use M-banking. This approach is considered appropriate given that a predictor construct can also be conceptualized as either a moderator or a mediator, depending on the research design (Hair et al, 2017). Moreover, since consumer readiness is actionable by management, its inclusion as a moderator is considered a useful extension of current literature, as it will enable us to test how various components of the construct affect the hypothesized link between consumers' attitudes and intentions to use M-banking.

**Ability:** Ability refers to having the necessary skills and confidence required to do a task (Ellen et al, 1991). In other words, it is what a person "can do" rather than what he or she "wants to do" or knows "how to do" (Meuter et al, 2005, p.64). This concept is perceived to be similar to self-efficacy (Bandura, 1997),

which is a belief that one has the skill to carry out a task. Based on this perspective, it is expected that people who believe that they are able to, or can perform tasks associated with M-banking, are more likely to engage in that behavior than those who believe they cannot. This logic informed the statement of the third hypothesis as follows:

**Hypothesis 3:** The level of ability of consumers will positively and significantly moderate the relationship between attitude to M-banking and future usage intention.

**Motivation:** Motivation has been identified as a major predictor of usage of technology (Barczak et al, 1997; Meuter et al, 2005). In the current study, we adapted three items measuring expectancy motivation (See Meuter et al, 2005). Since consumers have many options to access banking services such as via direct branch visit, and other SST platforms, it is reasonable to contend that those who are highly motivated to co-produce the service on their own will have a more positive attitude to using M-banking channels. Following on from this insight, the fourth hypothesis was stated as follows.

**Hypothesis 4:** The motivation level of consumers will positively and significantly moderate the relationship between attitude to M-banking and future usage intention.

**Role Clarity:** The contention here is that since using SSTs requires a set of new coproduction behaviours by consumers (Meuter et al, 2005), consumers who have a better understanding of how to use this platform, will have stronger



and more positive attitudes to using such technologies. Based on the foregoing viewpoint, the fifth hypothesis was proposed as follows:

**Hypothesis 5:** The level of consumers' role clarity will positively and significantly moderate the relationship between attitude to M-banking and future usage intention.

## **METHODOLOGY**

### ***Measurement and Scaling***

The main aim of this study was to investigate whether perceived measures of consumers' inherent innovativeness and readiness exert a significant effect on their attitudes towards mobile banking. The antecedent/exogenous variable, inherent innovativeness and the mediator, attitude to M-banking, were adapted from Dabholkar and Bagozzi (2002). The endogenous variable, intentions to use mobile banking, was from Ajzen and Fishbein (1980). The moderator, consumer readiness, was obtained from Meuter et al (2005). The control variables, need for interaction and perceived behavioural control, were based on a research by Dabholkar et al (1996) and Ajzen (2002) respectively.

Inherent innovativeness was measured with three items, anchored on a 7-point Likert Scale, ranging from 1 = Strongly Disagree, to 7 = Strongly Agree. Attitude to M-banking was captured with 6 items on a 7-point Semantic Differential scale with the bipolar words unpleasant-pleasant, harmful-beneficial, unfavourable-favourable, unsecure-secure, and difficult-easy. Intention to use M-banking was measured with two items on a 7-point Likert scale, while consumer readiness was measured with 11 items on a 7-point Likert scale. Finally, need for

interaction and perceived control of behaviour, were captured with 4 items and 2 items respectively, on a 7-point Likert scale.

### ***Sampling and Respondents Profile***

To test the proposed conceptual model, survey data from a structured questionnaire was obtained from 720 respondents using an online panel in the United Kingdom (UK). Overall, the number of usable responses received was 720. Of the usable respondents, 59.7 percent were female with the rest being male.

The respondents were relatively young with 73 percent aged under 40 (i.e., 18-25, 26-30, 31-35, and 36-40, representing percentages of 22.3, 22.4, 15.9, and 12.4 respectively). 83 percent of the respondents also had a diploma or higher degrees (High School = 17 percent; Diploma=15.7 percent; Associate degree = 42.8 percent; Bachelors =18.2 percent; Masters = 4.9 percent; and Ph.D. holders = 1.4 percent). The majority of the respondents (26.9 percent) reported receiving a monthly income between £1,000 and £1,500 while the lowest percentage (1.9 percent) fell in the £3,500 to £3,999 category. Concerning the types of banking services accessed, most of the respondents appear to use M-banking to check their account balances, transfer money, make payments and managing credit cards.

In terms of the extent of M-banking usage, about 75 percent of the respondents (539) indicated that they have used M-banking to various degrees (ranging from "Very Often =39 percent; Often =15 percent; Sometimes =10 percent and

Rarely =11 percent), while 25 percent responded they have "never used" the service. Though the percentage of respondents who indicated they have never used M-banking was comparatively smaller than those who had used the service, we did not expect this to significantly impact on the analysis given the large sample obtained for the analysis.

### **Control Variables- Demographics and Psychographics**

Following on from insights from the literature, we included control variables relating to demographic and psychographic characteristics of the respondents (See Dabholkar, 1996; Dabholkar and Bagozzi, 2002; Wang et al, 2013). We specifically, included demographic variables such as age, gender, education and income as past studies research (Nilsson, 2007) suggests that these influence consumers' attitudes to SSTs.

The psychographic variables included were 'perceived control over behavior' (Ajzen, 2002) and 'need for interaction' (Dabholkar, 1996). The reasoning behind their inclusion was that individuals with a high perception of behavioral control may be more predisposed to take personal initiative to adopt a new technology than those with low behavioral control. In addition, consumers with a high need for interaction, tend to prefer accessing services with the assistance of service employees (Meuter et al, 2000 and 2005; Dabholkar, 1996). It was considered important to control the potential effects of these variables in order to determine the unique influence of inherent innovativeness on the dependent variables in our model (attitudes and intentions to use M-banking).

**(Table 1 about here)**

## **FINDING AND ANALYSIS**

Smart PLS3 software was used to evaluate both the measurement and structural models for the proposed conceptual model. The main analytical techniques used were mediation, analysis of variance and moderation analyses. The outcomes from the various analyses are reported next.

### ***Measurement Model***

The results for evaluating the measurement model are shown in Table 1. All item loadings were adequate, ranging between 0.692 and 0.958. The constructs also demonstrated very good reliability results. Both Cronbach's alpha and composite reliability values were above the 0.70 threshold (See Anderson and Gerbing, 1988). In addition, the measurement model demonstrated appropriate construct (convergent and discriminant) validity (Table 2). The average variance extracted (AVE) values were above 0.5, thereby indicating convergent validity.

The diagonal values (**bold**) in Table 2 represent the square root of the average variance extracted (AVE) for each construct. Off-diagonal values represent the correlations (shared variance) among the constructs. The general recommendation is that the diagonal values should be greater than off-diagonal figures to demonstrate discriminant validity (Fornell and Larcker, 1981).

**(Table 2 about here)**

### ***Effect of Control Variables***

To check if the observed effects in our model were significantly impacted on by other explanatory variables, we constructed three nested models. These were the predictor (inherent innovativeness), the criterion or dependent variables (attitude/Intentions to M-banking, and the whole block of control variables) ( $R^2 = 0.206$  on attitudes;  $0.523$  on intentions,  $p = 0.005$ ). The second model consisted of the proposed model, without the control variables ( $R^2 = 0.036$  on attitudes;  $0.489$  on intentions,  $p = 0.000$ ). Finally, the third model consisted of only the control and the dependent variables ( $R^2 = 0.199$  on attitudes;  $0.211$  on intentions,  $p = 0.000$ ). The huge change in  $R^2$  in model 2, after isolating the effect of the block of control variables, seems to lend support for the importance of the control variables in explaining attitudes to M-banking. Nonetheless, given that model 2 (which included the predictor variable without control variables) was still significant, it is safe to argue that inherent innovativeness significantly explained consumers' attitude and intentions to use M-banking, even after controlling for the effects of other determinants.

### ***Structural Model***

After evaluating the measurement model, the structural model was assessed using the bootstrapping calculation technique with 5,000 resamples to generate the statistics necessary to evaluate the hypothesized direct relationships in the proposed model as well as the mediation hypotheses (Henseler et al., 2009). Figure 2 shows the results of the bootstrapping analysis including path coefficients, t-values, and p-values.

### **Effect of Inherent Innovativeness**

The hypothesized direct relationships between inherent innovativeness and attitude to M-banking was supported (t-statistics = 5.347,  $p = 0.000$ ). Thus, this outcome indicate a direct and positive influence of inherent innovativeness on attitude to mobile banking. Therefore, H1 (Inherent innovativeness exerts a direct and significant effect on attitude to mobile banking), was supported. Further analysis was performed to investigate if high inherent innovative consumers have more favourable attitude to mobile banking than low inherent innovators. ANOVA test using SPSS was utilized for this analysis. We first employed a median split technique to categorize respondents into high and low inherent innovators. Following this, 296 respondents fell into the low inherent innovativeness category while 336 fell into the high category. The ANOVA results suggest a significant difference between the two groups ( $F = 15.563$ ,  $p = 0.000$ ). The mean values were 5.123 and 5.601 for the low and high categories, respectively. Thus, this outcome provided further support for hypothesis 1.

## **Mediation Analysis**

In testing the mediation effect of attitude to mobile banking (H2), we used the procedure suggested by Baron and Kenny (1986) and recently augmented by Nitzl et al. (2016). The outcome of the mediation model is shown in Figure 2. The indirect effect of inherent innovativeness on intention to use mobile banking was significant. Inherent innovativeness (a) has a positive and significant impact on attitude to mobile banking (0.188,  $t= 5.116$ ). Similarly, attitude to mobile banking (b) has a positive and significant effect on intention to use mobile banking (0.683,  $t= 26.245$ ).

### **(Figure 2: about here)**

In testing the direct relationship between inherent innovativeness and intention (c'), the results showed a positive and significant relationship (0.085,  $t= 3.029$ ), indicating a partial mediation effect. In addition, given the relatively stronger effect of attitude (b), compared to direct effect of the predictor variable (c'), we can safely say that H2, which suggested that consumers' attitude to M-banking mediates the relationship between inherent innovativeness and intention to use that service, was supported.

## **Moderation Analysis**

Another important objective of this paper was to test the moderation effect of three dimensions of consumer readiness (ability, motivation and role clarity) on the hypothesized link between consumers' attitude and their intention to use M-banking. Moderation analysis aims at examining the extent to which the

relationship between two variables, an exogenous (Independent) variable and endogenous (dependent) variable, is influenced in strength or direction by a third variable (Hair et al, 2017; Baron and Kenny, 1986). Since the objective of the study was to identify the statistical significance of the moderators, we employed the two-stage approach via Smart PLS (See Hair et al, 2017, p.272). First, we examined the moderator measurement models to ensure that all the construct measurements were reliable and valid. The indicator loadings (AVE, Cronbach Alpha, Composite Reliability and Convergent validity) for the measurements in each of the three moderator models, were well above 0.70. The indicators ranged from a minimum of 0.75 to a high 0.92 at a p value of 0.000. The relevant results of the three separate moderation analyses are outlined in the Table 3.

**(Table 3 about here)**

As illustrated in Table 3, the outcomes from the various analyses indicate that only the ability dimension of consumer readiness exerts a positive and a significant effect (0.061;  $p=0.032$ ) on the path between attitudes and intention to use M-banking. Given the positive path coefficient, the outcome suggests that at high levels of the moderator (i.e. if ability increases by 1 standard deviation), the relationship between consumers' attitudes and intention to use M-banking increases by 0.061. However, the effect size ( $f^2$ ) of the interaction term/moderator, which shows (the unique variance in the endogenous variable solely ( $R^2$ ) attributable to the moderator variable), can be described as very small (0.008) (See Kenny, 2016, cited in Hair et al, 2017, p.256). Despite the small effect, it can be safely concluded that hypothesis 3, suggesting a positive



and significant effect of *ability* on the link between attitudes and intention to use M-banking, was supported.

The effects of *motivation* (-0.005,  $p=0.879$ ) and *role clarity* (-0.009,  $p=0.755$ ), were however, insignificant and negative. Thus, hypotheses 4 and 5 suggesting a positive and significant effect of these variables on the link between attitudes and intention to use M-banking, were not supported. The implications of the foregoing findings are discussed next.

## **DISCUSSIONS**

As put forward in the introduction, the literature review and conceptual perspectives sections, the motivation for the current research was to provide a fresh perspective to conceptualising and empirically testing the determinants of M-banking and SST adoption. We consider this as a worthy research agenda as the extant literature has mainly been based on innovation characteristics and surface personal factors as key antecedents of SST adoption. Consequently, very little attention has been given to exploring the possible ways in which deeper personal traits, such as *inherent innovativeness*, may uniquely explain attitudes towards emerging SSTs, such as mobile banking.

Drawing insights from previous research in socio-psychology and innovation/SSTs adoption, this paper proposed and tested a structural model with inherent innovativeness as an antecedent variable, and consumers' attitude to M-banking, as a mediator to their intentions for future usage. The

proposed conceptual framework was underpinned by the theory of individual inherent innovativeness (Midgley and Dowing, 1978; Hirschman, 1980). In addition, the paper explored the potential moderating effect of consumer readiness on the hypothesized relationship between attitudes towards and intention to use mobile banking. We also integrated key potential explanatory variables relating to demographic and psychographic factors as control variables, in order to isolate the unique contribution of the antecedent-predictor variable. In the next section, we discuss the implications, and possible reasons accounting for the observed outcomes from this study.

### ***Effect of Inherent Innovativeness***

First, the results from the analysis testing the direct and significant effect of inherent innovativeness on consumers' attitudes to mobile banking, was supported. Moreover, additional analysis shows that high and low levels of inherent innovativeness in different groupings of consumers significantly account for different attitudes to M-banking. Thus, individuals with a high inherent innovativeness trait demonstrate a more favourable attitude to mobile banking compared to those with low inherent innovativeness. In other words, individuals who possess high degrees of inherent innovativeness, tend to show more positive attitudes to using it than those with low levels of inherent innovativeness.

Given the paucity of research on the direct effect of personality traits on attitudes to innovation adoption, this finding provides further extension of the literature on the effect of individual traits on consumers' response to SST adoption (Thakur and Srivastava, 2014; Yi et al., 2006; Dabholkar and Bagozzi,

2002). In particular, the outcomes reported here can be considered as making a unique contribution to the literature as the previous studies (Thakur and Srivastava, 2014; Dabholkar and Bagozzi, 2002), conceptualized inherent innovativeness as an endogenous rather than as an exogenous or antecedent-predictor. Thus, by establishing a direct and a significant effect of inherent innovativeness on consumers' attitudes to M-banking, this paper offers another conceptual perspective as well as empirical verification of the importance of this construct in technology adoption in general, and M-banking in particular. Moreover, this finding re-echoes an earlier call by some researchers that service organisations should avoid forcing customers to use their SSTs. This is because some consumers segments may not be happy or comfortable with the use of certain kinds of emerging SSTs, which are rapidly replacing human-mediated service channels (Thakur and Srivastava, 2014; Wang et al, 2013; Chemingui and Iallouna, 2013; Reinders et al, 2008), especially, in retail banking.

### ***Mediation Role of Attitudes to M-Banking***

The results also suggest a partial mediation effect of consumers' attitudes on the link between inherent innovativeness and intentions to use mobile banking. Even though a direct effect of inherent innovativeness on intention to use mobile banking was also positive and significant, the mediation effect via consumers' attitudes, was significantly stronger than the direct effect. This outcome may not be surprising, given the well-established link between attitude and intentions in the literature (Wessels and Drennan, 2010; Dabholkar and Bagozzi, 2002; Ajzen, 1991). It is, however, important to highlight that the

mediation effect of attitudes, on the link between inherent innovativeness and intention to use M-banking, had not been directly tested before.

### ***Moderation of Effect of Consumer Readiness***

In line with the third objective of this study, three hypotheses relating to the potential moderating effects of the three dimensions of consumer readiness (ability, motivation and role clarity) on the link between attitudes and intention to use M-banking, were tested. The results show that only ability has a positive and a significant effect on the examined relationship. In other words, consumers who perceive themselves as more capable of using M-banking, are more likely to use this service interface compared to those with lower perceptions of their ability. This outcome extends the few studies (Meuter et al, 2005; Wang et al, 2013) regarding the positive and mediating effects of ability (or self-efficacy) on intentions/actual trial of SSTs. Moreover, from methodological perspective, it also extends the literature by validating the potential moderating effect of the construct.

Contrary to our prior expectations, the interaction effect of the motivation and role clarity dimensions, appear to be insignificant and negative. These findings may seem to go against earlier findings by Meuter et al (2005), which indicate that role clarity and motivation are relatively strong mediators for innovation trial. These differences in results may, however, be explained by certain conceptual design differences between the two studies. First, it is important to highlight that while Meuter et al (2005) conceptualized consumer readiness as

a mediator between innovation characteristics, individual differences and trial of SSTs, this paper modelled the construct as a moderator on the link between attitudes and intentions to use M-banking. Thus, it is probable that the effects of motivation and role clarity may have been constrained by other unexplained variables in the modified conceptual model in the current study.

Second, it is important to highlight that this study only adapted three items measuring global/intrinsic motivation. These items were as follows: *If I make the effort I could successfully do banking transaction via mobile banking; If I tried to use mobile banking I think I would be successful to access my account services; Making an effort to use mobile banking would enable me to access banking services successfully.* Instructively, Meuter et al (2005) employed a detailed measurement of motivation covering both intrinsic and extrinsic motivation. Thus, it is reasonable to argue that the moderation effect of motivation in the current study may have been positive and significant if we had used a broader measurement of the construct.

Relatedly, the outcome suggesting the insignificant moderation effect of role clarity, was also unexpected. Perhaps, this outcome may have been due to the difficulty associated with changing attitudes with less concrete interventions. This is because past studies indicate that changing attitudes towards SSTs require more concrete and hand-holding strategies, which encourage customers to develop the habit of using SSTs over time (See Wang et al, 2013, p.410), rather than use of cognitive change strategies. Thus, it may be that role clarity initiatives, such as educational and advertising campaigns, aimed at

altering the cognitive structures and existing beliefs of consumers about M-banking, may not be enough to change consumers' attitudes.

## **CONCLUSIONS AND IMPLICATIONS**

A central contribution of this study is the finding that personal differences relating to inherent innovativeness significantly explain consumers' attitudes to M-banking. The results from a mediation analysis also indicates that consumers' attitudes to M-banking partially mediate the link between inherent innovativeness and intention to use that form of SST. There was, however, mixed outcomes concerning the moderating effects of three dimensions of consumer readiness on the link between attitudes and intention to use M-banking. The results show that only the ability dimension of the construct exerts a positive and a significant effect on the examined relationship. The effects of *motivation* and *role clarity* dimensions seemed insignificant. The managerial implications of these findings are discussed next.

### ***Managerial Implications***

To date, the increased pace of technological advancement has spawned a proliferation of self-service technologies in many service industries (Thakur and Srivastava, 2014; Oh et al, 2013; Wang et al, 2012 and 2013), especially, in information-based sectors such as retail banking. Arguably, many banks seem to be adopting digitized channel strategies under the assumption that all consumers are inherently innovative or technologically-wired to enjoy the use the emerging self-service technologies. The findings from this research, however, suggest that there may be a justifiable need for bank and other

service managers to pay equal attention to segments which are less inclined to use self-service digital channels. We discuss some relevant implications of the study's findings, which could help managers improve the service experiences of various consumer segments, especially, in retail banking.

Firstly, it seems palpable to argue that inherent traits may be another useful basis to segment retail banking customers in order to inform the alignment of service delivery strategies to specific customer categories. This is important because studies show that forcing all customers to use SSTs may result in negative attitudes towards that channel and the service provider (See Wang et al, 2013, p.411; Reinders et al, 2008). Thus, it is advisable for banks to maintain or develop multichannel strategies that take into account the unique needs of consumer segments, which may be less-inclined to use M-banking in order to help improve their service experience. Perhaps, it seems appropriate and logical to suggest that consumers with low inherent innovativeness trait, may prefer to use tellers or human-mediated channels (e.g. telephone banking) compared to other purely technological-mediated channels.

Secondly, the significant mediation effect of consumers' attitudes between inherent innovativeness and intentions to use M-banking, has some relevant implications for the effective use of strategies aimed at influencing consumers who are less likely to use SSTs. Given that inherent traits cannot be easily be manipulated or altered, managerial intervention programmes will have to focus on innovative and more tangible attitudinal change programmes, in addition to

maintaining multichannel strategies comprising both human and technology mediated channels.

In particular, the finding that the ability dimension of consumer readiness positively and significantly moderates the attitude-intentions path is very instructive. This insight suggests that managers may be more successful in converting consumers, who are less-wired to use M-banking platforms, by offering them practical and hands-on use demonstrations of M-banking (see Wang et al, 2013). For example, banks could set up demonstration centres in places such as malls, selected branches and other strategic locations to give relevant customer segments real life opportunities to perform various retail banking services via mobile banking platforms. Other attitudinal change strategies may be in the form promotional programmes, which reward consumers for the use of M-banking to access various services.

### ***Limitations and Research Implications***

First, the mixed outcomes regarding the effect of consumer readiness on the hypothesized link between attitudes and intentions to use M-banking could be further explored. With the benefit of hindsight, we consider that it would have been more appropriate to include a broader measurement of the motivation dimension of consumer readiness, comprising both its extrinsic and intrinsic aspects. We expect that a broader measurement of motivation can afford future researchers a better chance of verifying the potential moderating effect of this dimension on the link between consumers' attitudes and intention to use mobile banking.



Second, even though our data set was reasonably large and representative across many demographic segments (age, gender, education and income), it was based on respondents from a developed Western country, in the United Kingdom. Given that differences in socio-economic conditions between developed and developing countries, may account for consumers' attitudes in general (see Hofstede, 1980; Venzin et al., 2008), cross-national/cultural samples could help enhance the external validity of the conceptual model and findings reported in this paper. For example, it may be interesting to test the extent to which the findings reported in this paper may be influenced by cultural differences relating to collectivism/individualism among respondents from developed and developing economies.

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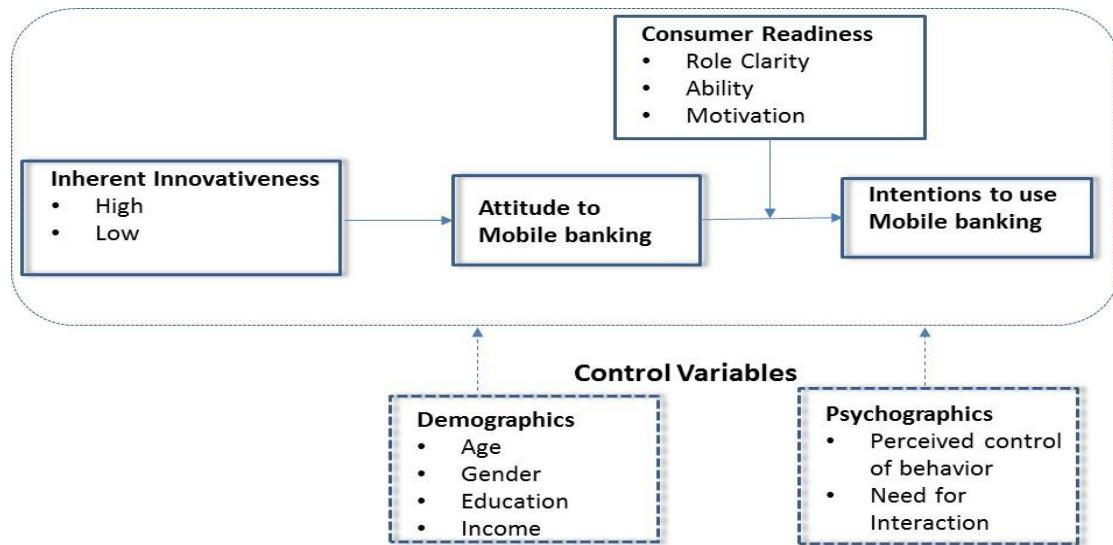
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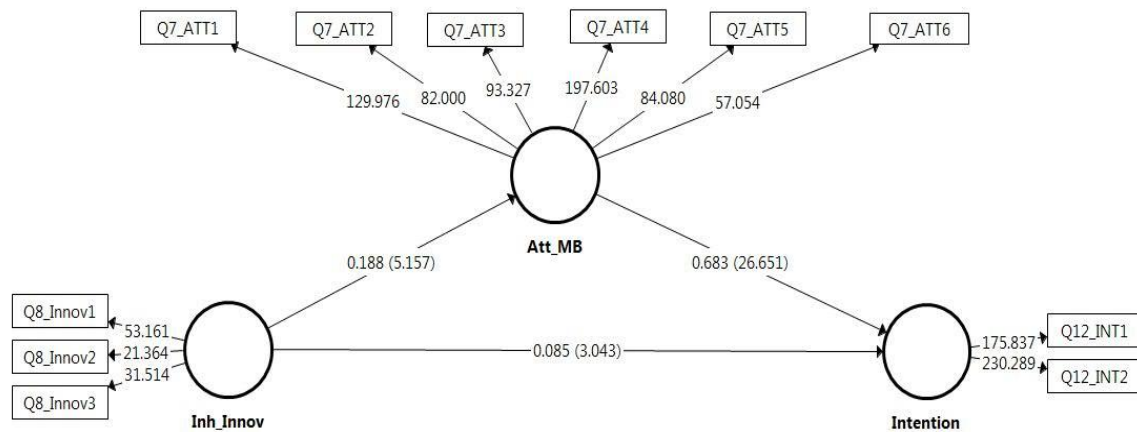
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**Fig. 1: Conceptual Model**



**Figure 2: Model Showing the Outcome of Mediation Analysis**



**Table 1: Reliability & Convergent Validity**

Construct/ Indicators	Loading	P-values	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
<b>Inherent Innovativeness</b> Innov1 Innov2 Innov3 (Dabholkar and Bagozzi, 2002)	0.892 0.792 0.827	0.000 0.000 0.000	0.792***	0.876***	0.703***
<b>Attitude to M- banking</b> ATT1 ATT2 ATT3 ATT4 ATT5 ATT6 (Dabholkar and Bagozzi, 2002)	0.932 0.893 0.919 0.946 0.875 0.845	0.000 0.000 0.000 0.000 0.000 0.000	0.954***	0.963***	0.814***
<b>Intention to use M-banking</b> INT1 INT2 (Ajzen & Fishbein, 1980)	0.949 0.958	0.000 0.000	0.900***	0.952***	0.909***
<b>Role Clarity</b> RClar1 RClar2 RClar3 RClar4	0.880 0.840 0.870 0.909	0.000 0.000 0.000 0.000	0.898***	0.929***	0.766***
<b>Ability</b> Ability1 Ability2 Ability3 Ability4	0.895 0.880 0.832 0.848	0.000 0.000 0.000 0.000	0.888***	0.922***	0.747***
<b>Motivation</b> IntMo1 IntMo2 IntMo3 (Meuter et al, 2005)	0.788 0.769 0.863	0.000 0.000 0.000	0.954***	0.963***	0.814***
<b>Need for interaction</b> Interact1 Interact2 Interact3 Interact4 (Dabholkar, 1996)	0.765 0.798 0.763 0.790	0.000 0.000 0.000 0.000	0.800***	0.861***	0.607***
<b>Perceived control of behavior</b> PBC1 PBC2 PBC3 (Ajzen, 2002)	0.692 0.892 0.841	0.000 0.000 0.000	0.748***	0.852***	0.661***

\*\*\* p&lt; 0.01

**Table 2: Discriminant Validity**

	Ability	Att_MB	Inh_Innov	Intention	Interaction	Motivation	PBC	RClarity
Ability	<b>0.864</b>							
Att_MB	0.471	<b>0.902</b>						
Inh_Innov	0.163	0.189	<b>0.838</b>					
Intention	0.480	0.699	0.214	<b>0.954</b>				
Interaction	-0.253	-0.165	0.068	-0.208	<b>0.784</b>			
Motivation	0.699	0.372	0.127	0.419	-0.205	<b>0.808</b>		
PBC	0.736	0.385	0.194	0.431	-0.286	0.607	<b>0.813</b>	
RClarity	0.727	0.619	0.213	0.606	-0.217	0.514	0.596	<b>0.875</b>

Ability (Ability); Attitude to Mobile Banking (Att\_MB); Inherent Innovativeness (Inh\_Innov); Intentions to Use Mobile Banking (Intention); Need for Interaction (Interaction); Intrinsic Motivation (Motivation) Perceived Control of Behaviour (PBC); Role Clarity (RClarity).

**Table 3: Moderation Effects of Consumer Readiness Dimensions on the Relationship between Attitudes to and Intentions to Use M-banking**

Moderator (Consumer Readiness)	Path Coefficients	R Square	T Statistics	Effect Size (f <sup>2</sup> )	P Values
Ability	0.061	0.522	2.146	0.008	0.032*
Motivation	-0.005	0.516	0.152	0.000	0.879
Role Clarity	-0.009	0.531	0.312	0.000	0.755

\*Indicates significant moderation effect. NB: The p values and t-statistics reported are only the for the path coefficient results. The R square figures were all significant at p=0.00