



An Assessment of Proximity Technology Adoption from a User's Perspective

I. A. BROHI, N. I. ALI\*, M. Y. KOONDHAR\*\*, A. SHAH<sup>++</sup>.

Department of Information Systems, International Islamic University Malaysia

Received 10<sup>th</sup> June 2018 and Revised 15<sup>th</sup> September 2018

**Abstract:** The rapid growth and convenience in mobile technologies has attracted every individual in today's era. Consumer convenience and comfort has remained key focus in almost every industry and such services are also existing and progressing in the domain of other service. Whereas, stakeholders of digital service providers are trying to change the exchange system from one to other society. Whilst, MPs has advanced in some countries, but few are still facing the resistance by people due to dominance of old system and lack of MP solutions. Whereas, in Pakistan existing MP services are generally offered by FIs and telecom sector. Despite a major share in the market these stakeholders have not played the important role for driving the country towards digital society and bringing the uncovered population of the country into inclusion network. Therefore, this study aims to assess the obstacles in acceptance and use of MPs by using UTAUT model with external variables.

**Keywords:** MP, Proximity, Contactless, UTAUT, IDT, Trust, Pakistan

1. **INTRODUCTION**

Mobile phone penetration and popularity have inspired to develop MP solutions for users to use their handheld devices in a more efficient and effective style. MP is defined as bringing together mobile technology and disbursement system to enable the consumer to pay for goods and services without using the conventional methods (Dahlberg and Öörni 2007). During recent past digital service approach has been changed but not limited to only paying for goods and services at POS, but the availability of funds transfer between accounts, sending and receiving funds at different locations, using NFC enabled smartphone for paying such as parking, ticketing, transportation, and so on. Such developments motivated various organizations to move forward and participate into building efficient, secure, and fast MP solutions in order to enhance their quality of services and play as a major stakeholder in the market. FS is one of the leading industry to incorporate new technological changes to enhance their operational and functional capabilities. Whereas, telecommunication is an that is extensively accepted in every part of the world without any delay.

Despite many decades of operation, FIs were unable to bring remotely located population into monetary inclusion network. Safaricom a telecom company in Kenya launched M-PESA service in the year 2007 to provide services to cover the population of the country with commercial FIs providing the platform (Kimenyi and Ndung'u 2009). While Pakistan observed the first public discussion on BB in 2006 (Khan and Rashid

2015). In fact, first licences for providing BB service were issued in 2008. Later, Telenor Pakistan partnering with Tameer Micro Finance launched first such services under product name Easy paisa in 2009 to serve the less covered and poor population of the country to perform low-value transactions (Stryjak and James 2016).

2. **BACKGROUND**

MP services enable the less covered population to perform monetary transactions without having a regular account. Such services are beneficial to include the population that is located in remote areas where formal FS is unavailable (Kimenyi and Ndung'u 2009). Whereas, the share of rural population in Pakistan stands high with 61% and 39% urban (Stryjak and James 2016). Currently, full-service account holders in Pakistan are fewer than 1 in 10 individuals i.e. in total only 7% can access digital FS out of that 6.8% of adults have FI accounts with 0.3% have mobile money accounts. Whereas, the majority of dwellers have access to mobile phones that 79% of the population (Khan and Rashid 2015). Overall 84.5% population is under cellular coverage with a teledensity of 72.4% as of June-2017 (PTA 2017). The rapid penetration of mobile phones and improved cellular coverage drove the inclusion in Pakistan under MP services such improvement is reported by SBP with 87% (21 billion) growth in BB deposits. Figure 1 demonstrates the value and number of performed over the period July-2016 to Dec-2017.

<sup>++</sup> Corresponding author email: asadullah@iiu.edu.my

\* Institute of Mathematics and Computer Science, University of Sindh, Jamshoro, Pakistan

\*\* Information Technology Centre, Sindh Agriculture University, Tandojam, Pakistan

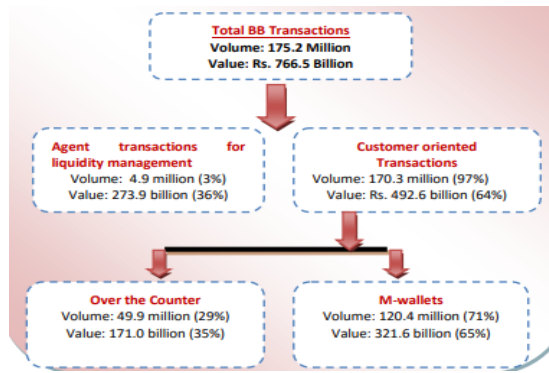


Fig. 1: volume and value of transactions. Source (SBP 2018)

Pakistan vision for (2025) key focus area is on extending inclusion parameters (Planning Commission 2014). The introduction of a Third Party Service Provider (TPSP) is an important development where stakeholders could integrate their resource in order to provide MFS (PTA 2017). Despite the key initiatives by regularity bodies i.e. SBP (primary) and PTA (secondary), the monetarist inclusion in Pakistan stands at 23% which is very low compared to regional and global standards (Khan and Rashid 2015). While, countries population is projected to increase to over 227 million; with 63% under the age of 30 years old by 2025 (Planning Commission 2014). The studies by WB and GSMA have estimated that even only 1% increase in mobile phone subscribers will increase 0.28% points of GDP growth (GSMA 2015). MFS in Pakistan fall under four different models with seven product offerings such as P2P transactions, bulk, bill, airtime top-ups, international remittances, loan settlements, and merchant paying (Khan and Rashid 2015). Also, the country is moving forward towards digital services by following global trends where multiple services are offered including contactless methods such as NFC (Brohi *et al.* 2018).

MP in Pakistan have shown significant progress and grow with the days due to continuous efforts of major stakeholders such as FIs and telecom industries. Despite, several services easily available at various locations, the acceptance and use of MPs are at a slow pace. To understand the obstacles related to acceptance by users a comprehensive study is required in the context of Pakistan. Thus, the aim of this study is to assess the acceptance, use of MPs, and identify the factors, which might hinder the success in MPs.

Research in the adoption of new technology and assessment of individual behaviour is not new. Success and failure of various technologies are measured through the understanding, adoption, and use by end users. While, most of the product and service modifications are done based on consumer behaviour

and understanding. The research community in information system has developed many models and theories to assess the human behaviour such as TAM, IDT, UTAUT, TRA, TPB, D-TPB, and MM. All these models and theories have been proved successful, but UTAUT stands as a most comprehensive model due to its development is based on eight well-known theories.

### 3. MATERIALS AND METHODS

In this section, the author defines the constructs used in the proposed model and formation of hypothesis in order to assess the acceptance and use of MPs in the context of Pakistan.

#### 3.1 Proposed Model and Hypotheses

This study aims to use UTAUT as baseline model with two variables from IDT, and one external variable from literature. Figure 2 demonstrates the proposed model used in this research to understand the adoption of MPs in Pakistan.

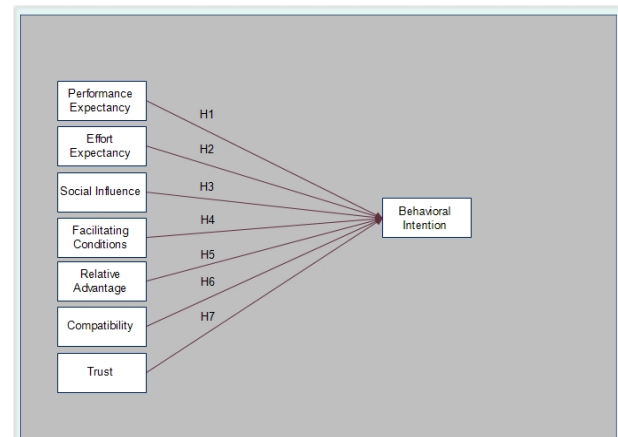


Fig. 2. Proposed research model

#### • Behavioural Intention

In this study behavioural intention is considered as a dependent variable. As mentioned consistently in nearly all psychological theories that individual behaviour is influenced by intention. Thus, the UTAUT also maintains and considers this belief that individual behaviour has an important influence on technology adoption and use (Venkatesh *et al.* 2003).

#### • Performance Expectancy

Performance expectancy is defined as “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (Venkatesh *et al.* 2003). PE indicates that the individual observation of growth in performance when using the particular system (Hayashi 2012). The consumer's perception that using MPs will increase his/her performance might influence his intention to adopt MPs. Thus, it is hypothesized that:

*H1. Performance expectancy will have a positive influence on behavioural intention to adopt MPs.*

#### • Effort Expectancy

Effort expectancy is defined as “the degree of ease associated with the use of the system” (Venkatesh *et al.* 2003). MP is different from conventional system substitutes where users are required to serve more time and efforts such as key-in multiple accounts, download certain features, and learn how to use the MP application. Also, it enables users to closely monitor their finances and MP providers greater accessibility that ultimately helps in controlling the expenses (Hayashi 2012). Thus, it directs to the following hypothesis:

*H2. Effort expectancy will have a positive influence on behavioural intention to adopt MPs.*

#### • Facilitating Conditions

Facilitating conditions is defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system” (Venkatesh *et al.* 2003). FC refers to users perceptions of the support and resources available to use a new system (Venkatesh *et al.*, 2012). Hence, the existence of supportive resources will increase the adoption of new technology. Therefore, the existence of basic infrastructure will encourage the users to adopt MPs. Thus, it is hypothesized that:

*H4. Facilitating conditions will have a positive influence on behavioural intention to adopt MPs.*

#### • Relative Advantage

Relative advantage is defined as “the degree to which an innovation is perceived as being better than the idea it supersedes” (Rogers 1995). The most important feature of MP is mobility and reachability that offers the advantage of MPs over other systems such as online fund transfers (Kim *et al.*, 2010; Xiaojun *et al.*, 2004). MP substitutes the other methods with exceptional benefits including efficient, convenient, and ubiquity which makes it a suitable alternative in the present situation for all kinds of paying methods. Thus, the current study hypothesis that:

*H5. Relative advantage will have a positive influence on behavioural intention to adopt MPs*

#### • Compatibility

Rogers (1995) defined compatibility as “the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters”. Compatibility is one of the major driving force for innovation adoption (Tornatzky and Klein 1982). Hence, the level of compatibility will measure the chances of new system adoption (Sonnenwald *et al.*, 2001). When a user integrates a new

system in his/her daily activities, the compatibility of MPs with the user’s present paying habits is likely to influence his/her intention to adopt the MPs.

*H6. Compatibility will have a positive influence on behavioural intention to adopt MPs.*

#### • Trust

Trust has been treated as a unitary and multidimensional concept that is difficult to define in different methods (McKnight *et al.*, 2002). Trust is a personal belief that FS stakeholders will fulfil their responsibilities, and it has high importance in uncertain activities where users are exposed to losses (Zhou 2014; Zhou 2013). Trust acts as a central aspect in economic transactions (Gefen *et al.*, 2003). Monetary activities are vulnerable to high risk and especially where multi-stakeholders are involved in providing the services. In MP contexts such as agents, MNOs, FIs, and TPS. MP services are provided by different stakeholders; thus, we propose the assessment of trust in providers context. Thus, it hypothesized that.

*H7. Trust will have a positive influence on behavioural intention to adopt MPs.*

## 4. RESEARCH METHODOLOGY

In this section, the author elaborates the research design, data collection technique, and statistical analysis tools that will be used in this study.

### 3.1 Research Design and Data Collection

This study will be based on quantitative data collection approach. Since the aim of this study is to assess the factors influencing the adoption of MPs in Pakistan. The targeted respondents will be MP users. Moreover, the random sampling method will be used to get the feedback from potential respondents. The rationale behind the selection of this sampling method is the availability of high number of active MPs users.

### 3.2 Data Analysis Tools

In this study, the latest version of SPSS software will be used for preliminary data analysis. Whereas, Smart-PLS 3.0 application will be applied for hypothesis testing.

## 5. DISCUSSION

Nowadays technology is involved in every field of human activities. MP is considered as a substitute for conventional methods due to its convenience and comfort. Pakistan is a fast-growing country where mobile penetration has reached 84.5% of the population with several MNOs are operational. The combination of MNOs and FIs have presented MPs services into daily activities of inhabitants which have opened a new era in the digitalization of the country which is a clear indication of following the changing trends in services.

## 6

**CONCLUSION**

In this paper, the author presented a proposed model for the study with UTAUT as baseline theory with additional variables. Also, the author described the research design, data collection, sampling, and data analysis tools that will be used in this research.

**REFERENCES:**

- Brohi, I. A., N. I. Ali, A. Shah, M.B.S.A. Aziz, and M.I.B.M. Tamrin. (2018). "Near Field Communication Enabled Mobile: Preliminary Study." *International Journal of Engineering and Technology(UAE)* 7 (2).
- Brohi, I. A., N. I. Ali, M. Karbasi, A. Shah, A. Akbar, A. R. Gharamah, and A. Ali. (2018). "Near Field Communication Enabled System Adoption: A Proposed Framework." In *2017 IEEE 3rd International Conference on Engineering Technologies and Social Sciences, ICETSS* 1–5.
- Chong, A., Y. Loong. (2013). "Predicting M-Commerce Adoption Determinants: A Neural Network Approach." *Expert Systems with Applications* 40 (2): 523–30.
- Dahlberg, T., (2007). "Understanding Changes in Consumer Habits-Do Mobile and Electronic Invoices Attract?" In *Proceedings of the Annual Hawaii International Conference on System Sciences*.
- Gefen, K., and Straub. (2003). "Trust and TAM in Online Shopping: An Integrated Model." *MIS Quarterly* 27 (1): 51.
- GSMA. (2015). "Supporting Pakistan's Vision 2025 through Mobile-Led Development." [http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/02/GSMA\\_Pakistan-1-pager\\_WEB1.pdf](http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/02/GSMA_Pakistan-1-pager_WEB1.pdf).
- Hayashi, F. (2012). "Mobile What's in It for?" *Kansascityfed.Org*. <http://www.kansascityfed.org/OkTWO/ieSWo/nVSUd/nNjOo/publicat/econrev/pdf/12q1Hayashi.pdf>.
- Karahanna, E., W. Detmar, and N. L. Chervany. (1999). "Information Technology Adoption across Time: A Cross-Sectional Comparison of" *JSTOR*. <https://www.jstor.org/stable/249751>.
- Khan, I. and N. Rashid. (2015). "Using Mobile Money to Promote Inclusion in Pakistan." <http://www.karandaaz.com.pk/wp-content/uploads/2017/02/Using-Mobile-Money-to-PromoteInclusion-in-Pakistan.pdf>.
- Kim, C., M. Mirusmonov, and I. Lee. (2010). "An Empirical Examination of Factors Influencing the Intention to Use Mobile." *Computers in Human Behavior* 26 (3): 310–22.
- Kimenyi, M. S., and Ndung'u. (2009). "Expanding the Services Frontier: Lessons From Mobile Phone Kenya." *The Brookings Institution*, no. July: 1–7. [http://www.w.gsma.com/mobilefordevelopment/wp-content/uploads/2012/06/1016\\_mobile\\_phone\\_kenya\\_kimenyi.pdf](http://www.w.gsma.com/mobilefordevelopment/wp-content/uploads/2012/06/1016_mobile_phone_kenya_kimenyi.pdf).
- McKnight, D. H., V. Choudhury, and C. Kacmar. (2002). "Developing and Validating Trust Measures for E-Commerce: An Integrative Typology." *Information Systems Research* 13 (3): 334–59.
- Planning Commission. (2014). "Pakistan Vision 2025," 1–120. PTA. 2017. "PTA Annual Report."
- Sonnenwald, D H, K L Maglaughlin, and M.C. Whitton. (2001). "Using Innovation Diffusion Theory to Guide Collaboration Technology Evaluation: Work in Progress." In *Proceedings Tenth IEEE International Workshop on Enabling Technologies: Infrastructure for Collaborative Enterprises. WET ICE 2001*, 114–19.
- Stryjak, J and H. James. (2016). "Country Overview : Pakistan A Digital Future."
- Tornatzky, L G, and K Klein. 1982). "Innovation Characteristics and Innovation Adoption Implication: A Meta-Analysis of Findings." *IEEE Transactions on Engineering Management* 29 (1): 28–45. <https://ieeexplore.ieee.org/abstract/document/6447463/>.
- Venkatesh, V., M. G Morris, G. B Davis, and F. D Davis. (2003). "User Acceptance of Information Technology: Toward a Unified View." *MIS Quarterly* 27 (3): 425–78.
- Venkatesh, V., Y. James L. Thong, and Xin Xu. (2012). "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology." *JSTOR*.
- Xiaojun, D., I. Junichi, and H O Sho. (2004). "Unique Features of Mobile Commerce." *Ccs.Asia.Edu.Tw* 2 (3). <http://www.ccs.asia.edu.tw/ezfiles/2/1002/img/519/0403-37.pdf>.
- Zhou, T. (2013). "An Empirical Examination of Continuance Intention of Mobile Services." *Decision Support Systems* 54 (2): 1085–91.
- Zhou, T.. (2014). "An Empirical Examination of Initial Trust in Mobile." *Wireless Personal Communications* 77 (2): 1519–31. doi:10.1007/s11277-013-1596-8.