

Service characteristics towards individual's adoption in Mobile Banking

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Abstract- This paper intends to explore the most important dynamics that impact individual's decision toward accepting and adopting a mobile service. The overall objective of this is to identify several mobile service characteristics which have not previously discussed in traditional acceptance theories. It will then be easier to differentiate the importance of service characteristics over the concepts in traditional acceptance theories. Moreover, the discussion sheds some light to our understating regarding the individual IT acceptance.

Index Terms- Mobile Banking, service characteristics, Individual's Adoption, technology adoption models

INTRODUCTION

Mobile Banking Services

In general „mobile“ means “fully portable, real-time access to the same information, resources, and tools that, until recently, were available only from the desktop” Bhattacharjee, (1998). It has been argued that the future of mobile communication will rely on mobile services (Carlsson et al., 2006). The rapid development in Telecommunication technologies as a subset of Information and Communication Technology (ICT) can be a plausible reason for Carlsson's prediction. Mobile services are digital services which are added to mobile phone networks or integrated to the mobile devices other than traditional voice services, and it is postulated that the benefit offered by such services are highly diverse (Bouwman et al., 2011). There are numerous different mobile services and applications available to consumers in the telecommunication market. But, many prior researches indicated that the individual acceptance and adoption of mobile services have not been proliferated (Bouwman et al., 2012) or shown an asynchronous pattern (Carlsson, 2005).

From service providers' perspective the mobile service market has not yet reached its optimal level in order to return the massive investments made by Telecommunications industries and Telecom carriers globally. A mobile service will be accepted and will be used by users, if that particular service offers value to its users. It means, there are several factors and criteria that make a service successful or a failure. A mobile service should be easy to use, provide hedonic value, improve user's performances and in general it should be perceived to be useful. Many of the current mobile services available in mobile communication market do not provide any value to its users. Another critical issue that may stimulate the individual mobile service adoption is the users' demographic information. Gender,

age, education, and income are considered to play critical role with regard to mobile service acceptance. For instance, a service might fit to men's preferences (mobile game), while, some services may only target females 'mobile web browsing' (mWomen, 2012). According to 'mwomen', in a research for comparing male and female mobile web browsing usage, it has been found that on an international basis, it is South Africa wherein the largest proportion of users are female, whilst the UK sits in fourth place on this particular measure (mWomen, 2012). Provider of mobile services also has been identified to have impact on users' decisions. While, until recently users have to be locked to a specific telecom operator, after the changes in telecommunication regulations, users can easily switch from one operator to another without being forced to give up their mobile number. In order to understand the individual acceptance of Information Technology (IT), several acceptance theories such as Technology Acceptance Model (TAM) (Davis, 1989), Diffusion of Innovation (DOI) (Rogers, 1995) or Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) have been postulated and systematically been tested in many prior studies.

In most of the prior researches the acceptance and adoption of mobile services were the main theme of the research. Many of prior researches were interested in studying on how and why a new innovation or technology spread. There is an extensive body of literature in which, researchers have used one or sometimes even a combination of the acceptance/adoption theories aiming to find an answer to contribute to the understanding of the acceptance and sustainable usage of the mobile services. For example, service perception and mobile service characteristics (Bouwman et al., 2011; Nysveen et al., 2005) and mobile commerce (Mahatanankoon et al., 2005), acceptance of advanced mobile services (López-Nicolás et al., 2008), service platforms (van Halteren and Pawar, 2006) and the impact of use context with regard to mobile ticketing (Mallat et al., 2009) have been extensively under researched. However, none of the prior research results have shown a complete solution for the acceptance and adoption of mobile services problems. To this end, we have discussed issues and problems that hinder the acceptance of mobile services. Having said that, still there are other issues which are more related to technology, Telecommunication standards, context of use, and cultural diversity which also will be discussed throughout this study. The rapid advancement in technologies and ease of use, coupled with the falling prices of devices, present the mobile phone as an appropriate and adaptable tool to bridge the digital divide. Cell

phones have not yet achieved these levels of quality, but they do offer "anywhere" convenience, a disruptive innovation advantage. The wireless industry is one of the most dynamic and growing industry in the world economy today. The rapid technological advancement that the world has witnessed in the recent years especially in the electronic industry has also changed the means of production around the world. I.E.C.(2005). This can be evidenced in the banking sector where, since the introduction and evolution of the mobile phones, the ways and means of business information transfer have changed leading to more effective in service rendered to customer by the banking sectors. However, mobile banking services are often differentiated as „push“ or „pull“. Pull is when a customer explicitly requests a service or information from the bank. While push, occurs when a bank sends an alert to a customer when their accounts goes below a threshold level. Pull services are often of higher security measures. Researchers in numerous spheres of the world had contributed in varied degrees to the existence of mobile banking and its originality into servicing customers effectively. Those scholars have evaluated some of the services mobile banking can offer. Such services include:

Account information:

Mini statements and checking account history, Alerts on account activity or passing of set thresholds Monitoring of term, deposits Access to loan statements, Access to card statements Status on cheque, stop payment on cheque

Payments and transfers:

Domestic and international funds transfer, Micro-payment, handling Mobile recharging

Investments:

Portfolio management service, Real-time stock quotes, personalized alerts and notification on security prices and etc.

Service Delivery and Mobile Banking

An understanding of the role of e-service delivery is critically important because a study has suggested that as much as \$8billion in potential sales were lost on 2001 due to inadequate e-service. Sichel, et al (2010). More importantly, as mainstream consumers begin to explore the world available to them on the web, they are likely to be less willing to put up with poor service. With the emergence of the mobile banking, customer focus has to be presented on the mobile electronic facilities platform. A key component of improving customers focus is the implementation of tools that allow development of better relations between banks and their customers (customer bank relationship). The banking industry today is witnessing heavy IT revolution to the extent that customers now have freedom to pay bills; plans payments while held in traffic jams, receive updates on banks transaction other. Mobile banking also welcomed other financial services like share trading, sophisticated enquiry based banking services for transaction alerts, minimum balance alerts, account balance enquiry, cheque book request, and bill payment alerts.

Several banks have launched the mobile banking services that enable customers to carry out simple transactions based on Short Message Services (SMS) technology with customer's mobile phones serving as the terminals. Such transactions include account balance enquiries, funds transfers between customer's

own accounts and to other account with the same bank, transaction tracking and third party payments, such as bill payments, cheque book request and balance confirmation. The security controls used are PIN code and pass code identification. Mobile banking service, also secure SMS messaging for confirmation of receipt to the beneficiary of services, mobile banking services have a very exciting potential within Tanzania, given the low infrastructural requirements and a rapidly increasing mobile phone penetration. Furthermore, increased service quality on mobile banking facilities can enhance more effective mobile banking service product and can help them to achieve higher levels of customer satisfaction.

Challenges of Mobile Banking Mobile phone operability:

There are a large number of different mobile phone devices and it is a big challenge for banks to offer mobile banking solution on any type of device. Some of these devices support Java ME and others support s Application Toolkit, a WAP browser, or only SMS. Initial interoperability issues however have been localized, with countries like India using portals like R-World to enable the limitations of low end java based phones, while focus on areas such as South Africa have defaulted to the USSD as a basis of communication achievable with any phone. The desire for interoperability is largely dependent on the banks themselves, where installed applications (Java based or native) provide better security, are easier to use and allow development of more complex capabilities similar to those of internet banking while SMS can provide the basics but becomes difficult to operate with more complex transactions.

Security of transactions: Security of financial transactions, being executed from some remote location and transmission of financial information over the air, are the most complicated challenges that need to be addressed jointly by mobile application developers, wireless network service providers and the banks' IT departments.

Advantages of Mobile Banking

- Mobile banking reasonably reduces the cost of rendering services to customers.
- For service providers, mobile banking offers the next surest way to achieve growth by offering suitable services to attract new customers or retain old ones.
- Mobile banking helps alert customers on trends happening in their accounts in order to minimize fraud.
- It also encourages them and wishes customers well on special occasions like birthdays of customers

Mobile Service Innovations Characteristics

Mobile devices with embedded software can support users' functionalities in their day-to-day lives or in their social systems. The benefits offered by these vast variety of advanced mobile services and applications are diverse. In other words, mobile services, applications and devices enable users to access all kind of information, interact with each other, perform a task, communicate, make banking transaction and even entertain themselves. Presumably, one can argue that the opportunities and benefits in mobile technology based on its ubiquitous character make the adoption/acceptance of these technologies inevitable. However, disregard for many opportunities and benefits in

mobile services and application, many prior researches show the failure of the adoption/acceptance of mobile service innovations (Bouwman et al., 2008a) and (López-Nicolás et al., 2008).

Generally speaking, the users expect mobile services or applications to be available at any moment, and any place, disregard for a specific context. In other words, it means that users want to use mobile services wherever they are and whenever they want to. Thus, we can argue that “mobility” plays a significant role in adoption/acceptance of mobile services. Mobility can be defined as moving around, either in time or in a place. Individual carry their mobile devices at anytime, anyplace to be in touch. Regardless of many effective attributes and benefits that mobile services offer, the concept of mobility is not the only character which has to be taken into account. Mobile services and applications, due to its ubiquitous characteristics, should be classified into many different ways to understand better individual acceptance toward mobile services and applications. Therefore, it is necessary to classify mobile services and applications in very understandable manner. Although, due to recent technological advancement many mobile services can fit in more than one group, however, we will classify them in the following ways (Bouwman et al., 2011), (Varshney, 2005), (Open Garden, 2009), (Kuo and Chen, 2006) and (Jeon and Lee, 2008).

Services such as telephony and SMS have been available to users for a quite long time, while some other service have recently been introduced and are available to users such as social network services (Facebook) and Mobile monitoring RFID (Radio-Frequency Identification) information.

While some services are designed specifically for individual, some other services are only designed for groups. Some of the mobile services can be used to access information such as looking for weather forecast, while other services provide information to the users such as advertisements via SMS. Some mobile services are designed to have information consumption purposes such as watching video or reading news. While some mobile services have the users participation purposes such as mobile chat or uploading a video in YouTube. In a discussion on user-generated content, (Shao, 2009) categorized mobile services into two groups, (i) consumption, and (ii) participation. In another research (Feijoo et al., 2009) has introduced a taxonomy for mobile services having two dimensions, (i) processed information (mobile stock market information) versus creative content (mobile game), and (ii), existing content adapted to mobile (mobile banking, mobile email) versus content which specifically developed for mobile (location based services or mobile augmented reality).

Context of Use

In order a mobile service to be accepted and adopted by a user, the service should provide values to its user. In other words, it means that the service should enhance user performance in doing a particular task. However, many prior researches indicated that context of use influences the user attitude and behaviour. If the contextual aspects match with the user requirement for using a particular service, the acceptance of that particular service will be increased. As the usage of mobile phones become increasingly

pervasive, people carry their devices almost anywhere (Mallat et al., 2009). Consequently, the use context has become increasingly important (Dourish, 2004). It is important to address that some contextual use poses implication to use a mobile service. For instance, due to lack of technological infrastructures or lack of network coverage in some areas, therefore, using a service might not be possible. One can argue that, use context plays a significant role in individual decision making toward acceptance and adoption of mobile services. In general, user expects that in every situation the ubiquitous computing will be available. Thus, this can be an indication for mobile service providers and developers to take contextual aspects of mobile service into an account while designing a service.

The most widely accepted definition of perceived value is the Zeithaml's definition that is “the overall assessment on the product (or service) utility determines by customer's perceptions of what is received and what is given” In services, it involves the comparison of what one is getting (i.e., benefits) and what he has to give up (i.e., sacrifices) in order to receive the service. Therefore, perceived value of mobile banking service in this study mean the customers' overall perception of its benefits and sacrifices needed to use it. From the conceptualization, perceived value consists of benefits and sacrifices. This study based on the thought that benefits and sacrifices are sometimes not equal. The difference could be positive or negative. The positive result will be customer perceived value, and the negative result will be customer perceived worthlessness. The benefits include the value desired by the customer while sacrifices include monetary and non-monetary considerations. Monetary sacrifice includes the price of the service, while non-monetary sacrifice includes elements like time and efforts. Therefore, to maximize the customers' perceived value, firms must either enhance the perceived value like quality, relative advantages and/or decrease their sacrifice (e.g. cost paid, risk to take).

A. Benefit Factors

Customers are highly interested in the benefits that a service would offer them once it is used. In essence, the customer seeks to establish the value that the service will add in his or her life before making the decision to adopt. Accordingly, the service must be able to satisfy the needs of the customer and provide benefits that make the service worth to adopt. This study addresses the benefit factors that mobile banking customers look out for performance expected and level of effort required. Performance expectancy denotes the degree to which customer believes that using the system will likely to improve his or her job performance. Customers basically have high expectations whenever they undertake a particular service to satisfy their needs. They expect that the service will guarantee value for their money and that it will perform in accordance to their expectations. Information System adoption research proposes that “a system that does not help people perform their jobs is not likely to be received favorably”. In the context of the mobile banking services usage, performance expectancy can be defined as the degree to which the mobile banking could extend benefits to individuals in their banking activities. Effort expectancy denotes the degree of ease with which an individual is likely to grasp the use of a system. Ease of use is enhanced by the use of simple technology and applications that are easy to operate; such

that little technical knowledge is required in using the system. Low effort expectancy can be said to be a benefit factor in the adoption of new technology and thus an important factor in explaining the usage of mobile banking. In this study, effort expectancy is defined as the degree of effort that a bank customer believes he or she needs to spend on using mobile banking service.

B. Sacrifice Factors

In the process of making decision, customers are expected to analyze various characteristics of the services, including the costs and benefits they are likely to encounter before and after using the service. Sacrifice factors denote what the customer is expected to part with or forego, in exchange for obtaining the service. These may include cost and risk associated with the use of a particular service; in this study, mobile banking services usage. The costs of the service is considered as one of the most imperative factors in the decision making process. This is because it determines the customer’s ability to use the service depending on availability of the specified amount and their set budget. Perceived cost is the perceived quantifiable costs of acquisition and use of technolog . Referring to Luarn and Lin’s definition, perceived financial cost is defined as “the extent to which a person believes that using mobile banking will cost money.” Customers also think of the risks they undergo if they adopt the new banking through mobile services; especially due to the rising number of hackings and identity theft that has invaded the e-commerce sector. Many people feel like they have exposed themselves to the possible theft and misuse of their bank accounts in the event that hackers get access to their secret codes or from friends and relatives who are likely to access their mobile phones. The customer may feel at risk and exposed to insecurity and uncertainty that makes him or her anxious about adopting mobile services such that they end up not enjoying the benefits derived from the mobile banking. This study adopted Featherman and Pavlou’s definition of perceived risk in electronic service context. Thus, perceived risk is defined as “a bank customer’s expectation of potential loss in the pursuit of a desired outcome of using mobile banking.

Consumer’s Acceptance toward New Technology

Advanced mobile technology has an impact on consumers’ service perception. Over the last years, mobile communication has been identified as the fastest growing segment of telecommunications (Glodsmith, 2005). Mobile devices and in particular smart-phones have become increasingly important device for people around the world. It has been argued that the number of mobile devices in many countries has already been exceeded the number of fixed access lines. According to, (ITU, 2011), "At the end of 2011, there were 6 billion mobile subscriptions, estimates The International Telecommunication Union (2011). That is equivalent to 87 percent of the world population. And is a huge increase from 5.4 billion in 2010 and 4.7 billion mobile subscriptions in 2009”. Users can use their mobile devices to make or receive calls and videos and perform other tasks such as shopping and banking transactions. These are services which are specifically designed to perform certain tasks. Therefore, if services are designed according to users’ preferences, then users’ acceptance toward technology and

particularly mobile technology will be increased. Figure 1 presents the research model as well as the proposed hypotheses and relationship between the eight constructs and the behavioral intentions to accept and use the mobile Internet. The study to investigate the relative impact of factors contributing to mobile Internet as a mean of Information and Communications technology acceptance across several consumers with different ages, experience, and educational backgrounds was also done by, Davis et al (1989), Thompson et al (1991), Igarria (1993), and Davis (1993) attempted something similar when investigating the acceptance of IT.

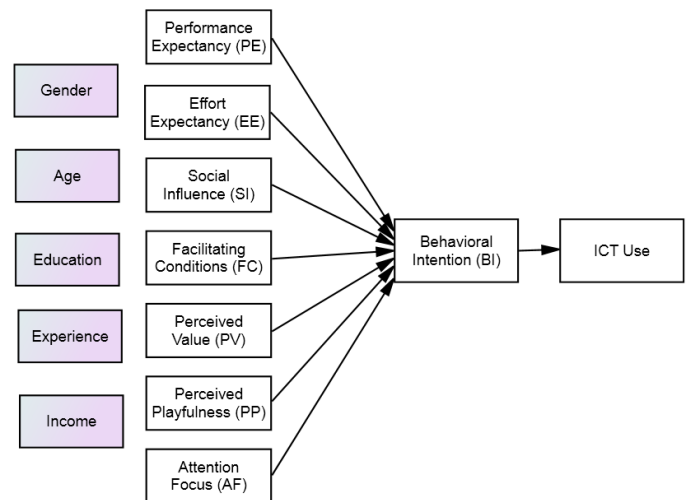


Fig 1: The Proposed Research Model

Agarwal (2000) defines technology adoption as the use, or acceptance of a new technology, or new product. In Information Technology and Information System (IT/IS) research, numerous theories are used to understand users’ adoption of new technologies. Various models were developed including the Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Innovation Diffusion Theory (IDT), Task Technology Fit (TTF), and recently, the Unified Theory of Acceptance and Use of Technology (UTAUT) are often used as the theoretical bases. Each of these models has sought to identify the factors which influence a citizen’s intention or actual use of information technology.

TAM proposes that perceived ease of use and perceived usefulness are two main beliefs affecting user adoption (Davis, 1989). Due to its parsimony, TAM has been used to explain user adoption of various mobile services, including mobile payment (Chandra et al., 2010), short message services (Lu et al., 2010), mobile shopping (Lu and Su, 2009), mobile ticketing (Mallat et al., 2009), and mobile Internet (Shin et al., 2010). IDT notes that relative advantage, complexity, compatibility, trialability and observability predict user adoption (Rogers, 1983). IDT has been examined in the context of multimedia message services (Hsu et al., 2007), mobile payment (Mallat, 2007), and mobile banking (Lin, 2011). TTF proposes that only when task characteristics fit technology characteristics will user performance be improved (Goodhue and Thompson, 1995). TTF has been used to examine

user adoption of location-based services (Junglas et al., 2008), and mobile work (Yuan et al., 2010).

UTAUT was developed by Venkatesh et al. (2003) to predict user adoption of an information technology. UTAUT integrated eight theories, including the TAM, IDT, the theory of reasoned action (TRA), the motivational model, the theory of planned behavior (TPB), a model combining the TAM and TPB, the model of PC utilization and social cognitive theory (SCT). With empirical analysis, Venkatesh et al. (2003) found that performance expectancy; effort expectancy, social influence and facilitating conditions are the main factors determining user adoption. Among them, performance expectancy is similar to perceived usefulness and relative advantage. Effort expectancy is similar to perceived ease of use and complexity. Social influence is similar to subjective norm. Since its inception, UTAUT has been used to explain user adoption of a variety of information technologies, including location-based services (Xu and Gupta, 2009), mobile technologies (Park et al., 2007), mobile banking (Zhou et al., 2010), Internet banking (Im et al., 2011), and health information technologies (Kijisanayotin et al., 2009). Due to the relatively low adoption rate of mobile services, extant research has paid much attention to prior work of Venkatesh (2003, 2012) and Zohu (2011) when identifying the factors affecting mobile user behavior.

Performance Expectancy reflects the perceived utility associated with using mobile Internet. Mobile Internet frees users from temporal and spatial limitations, and enables them to acquire information or services at anytime from anywhere. This can improve users' living and working performance and efficiency. According to the expectation confirmation theory, when users' expectation is confirmed, they will be satisfied (Bhattacharjee, 2001). Thus performance expectancy will affect user satisfaction. Extant research has also noted the effect of perceived usefulness (similar to per 64 performance expectancy) on satisfaction (Bhattacharjee, 2001; Lee et al., 2007a). In addition, performance expectancy will also affect continuance intention.

Effort Expectancy reflects the perceived difficulty of using mobile Internet. The constraints of mobile terminals such as small screens and inconvenient input have made it relatively difficult for users to search for information on mobile Internet (Lee and Benbasat, 2004). If users need to invest great effort on learning to use or skillfully using mobile Internet, they cannot feel satisfied. Thus effort expectancy will affect user satisfaction. In addition, users may discontinue their usage if mobile Internet service providers cannot present an easy-to-use interface to them. Prior research has revealed the effect of perceived ease of use (similar to effort expectancy) on user satisfaction (Lee et al., 2007a) and continuance usage (Shin et al., 2010). Social Influence reflects the effect of referees' opinion on individual user behavior (Zhou, 2011). According to social influence theory, users tend to comply with other important referees' opinions (Bagozzi and Lee, 2002). Thus when others who are important to a user recommend him or her to use mobile Internet, he or she may follow their suggestions. Hong et al. (2008) also found that social influence has a significant effect on the continuance intention of mobile data services.

Facilitating Conditions mean that users have the resources and knowledge necessary to use mobile Internet. Users need to bear the costs of using mobile Internet, such as communication fees and service fees. In addition, they need to be equipped with necessary knowledge to operate mobile Internet, which represents an emerging technology. If users do not own these resources and knowledge, they may not continue their usage of mobile Internet (Zhou, 2011).

Perceived Value is defined as the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given (Zeithaml, 1988). In the case of mobile Internet, potential users would probably compare all the attributes of mobile Internet usage with prices of previous mobile phone calls and stationary Internet access. The price value is positive when the benefits of using a technology are perceived to be greater than the monetary cost and such price value has a positive impact on intention. Thus, we add price value as a predictor of behavioral intention to use a technology (Venkatech et al, 2012).

Perceived Playfulness reflects the pleasure and enjoyment associated with using mobile Internet. Perceived enjoyment is an intrinsic motivation that emphasizes the usage process, whereas perceived usefulness is an extrinsic motivation that emphasizes the outcome (Davis et al., 1992). Users expect to acquire enjoyment when they adopt mobile Internet to obtain ubiquitous information and services. When this expectation is met, users will feel satisfied. Thus perceived enjoyment may affect satisfaction. O'Cass and Carlson (2010) also noted that flow affects user satisfaction with professional sporting team websites. Lee et al. (2007b) reported that flow affects online banking users' satisfaction. In addition, perceived enjoyment may also facilitate continuance usage. If users cannot obtain enjoyment from using mobile Internet, they may discontinue their usage due to an unpleasant experience. The effect of perceived enjoyment on user behavior has been validated in extant research (Koufaris, 2002; Dickinger et al., 2008).

Attention Focus reflects a user's immersion when using mobile Internet. Mobile users often perform multiple tasks on movement, such as listening to music and accessing mobile Internet. Thus their attention allocated to mobile Internet may be limited. If they cannot focus their attention, their experience may be affected (Zhou, 2011). This may decrease their satisfaction and continuance usage intention. Koufaris (2002) also noted that concentration (similar to attention focus) affects online shoppers' return intention.

Behavioral intention is defined as a person's perceived likelihood or "subjective probability that he or she will engage in a given behavior" (Committee on Communication for Behavior Change in the 21st Century, 2002, p. 31). With increasing experience, consumers have more opportunities to reinforce their habit because they have more time to encounter the cues and perform the associated behavior (Kim and Malhotra 2005). With increasing experience, routine behavior becomes automatic and is guided more by the associated cues (Jasperson et al. 2005). As

a result, the effect of behavioral intention on technology use will decrease as experience increases.

Cultural Characteristics and Diversities

For long, cultural differences between people have been a central topic of the research, this issue has also been discussed in mobile service adoption and how cultural differences impact the service adoption (Gallivan and Srite, 2005). Moreover, cultural traits have also been identified as one of the most important factor that impacts users' perceptions towards different features of IT and mobile services (Hiller, 2003). Cultural differences have undeniable effect on organizations and behaviour (Sarala, 2010). Firstly, in different cultures people have different values on the same topic. Secondly, cultural differences also lead to diverse type of behaviour. Thirdly, way of thinking is also different in different countries. For instance, due to the cultural differences between the Asian and the European users, some mobile services are perceived to be more useful than the other ones. Mobile game, for example is very popular in Japan, South Korea and China, but not in the European countries. Another example, is mobile TV, as people in Japan and Korea spend hours for commuting in daily bases, therefore they have more spare time to kill, consequently they use more entertainment services. On the other hand, people in Finland for example, they do not spend time as much as Asian for commuting, therefore the adoption and acceptance of mobile TV has failed. The perception of IT artifacts (mobile services in this study) is greatly influenced by cultural traits.

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