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# TOWARDS THE ADOPTION OF MOBILE COMMUNICATION SYSTEMS IN LIBYAN SECONDARY SCHOOLS

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### ABSTRACT

In the latest ITU report (2018), Libya has 121.72 mobile subscriptions per 100 inhabitants and also possesses one of the cheapest mobile broadband subscription rates in the middle east. Despite the prevalence of Mobile Communication Systems in Libya, schools in Libya have not shown commitments to adopt Mobile communication systems to conduct interactive communication between families/guardians of the students and the schools. Lack of proper communication from schools to parents/ guardians is a common complaint among the parents/ guardians of the students in Libya. Most often parents/ guardians do not receive information about their children academic performances, attendance, disciplinary issues and other matters of concern in a timely manner. Despite the tremendous popularity of Mobile Communication Systems in Libya, they are not utilized by schools and parents/ guardians as a medium of communication to enhance the student learning environment. This study aims to identify factors affecting mobile communication systems adoption in Libyan Secondary Schools and in accordance with Libyan cultural context. To achieve this aim, popular adoption theories like TRA, TPB TAM, DOI and UTAUT2 were critically reviewed and to understand Libyan culture, popular culture models like Trompenaars, Triandis, Schwartz and Hofstede as well as past cultural literature were reviewed. The result of this study facilitates further research to be undertaken with the objective of studying the effect of cultural values, perceived characteristics of mobile communication systems, trust in internet as well as perspective on communication could affect acceptance of mobile communication systems in Libyan Schools.

## 1. INTRODUCTION

Several past studies (Rakow and Navarro, 93; Kopomaa, 2000; Oksman and Rautiainen, 2002; Liu & Ling, 2004) have emphasized the significance role information systems plays to strengthen the relationship between schools and parents/ guardians. Also, these studies pointed out that the usage of these new technologies facilitates interaction between the parents/ guardians and their respective schools, which in return enables students to excel holistically. Mobile Communication Systems in particular if implemented could connect schools with student's parents/ guardians in accordance with Libyan cultural context, could be an effective method to assist students to improve and show significant achievement in the class.

A report by National Center for Family and Community Connections with Schools (2002), found strong and steadily growing evidence that families can improve their children's academic performance in school when they engage and frequently communicate with their schools. Also, a report by The Children's Partnership (2010) cautioned the need to invest only in classroom technology, but also in technology that links the school and home learning environments to better enable parents to support their children's learning.

Kraft et al., (2013) found that frequent and effective teacher and family communications immediately increased student engagement as measured by homework completion rates, on-task behavior, and class participation. A study conducted by US Department of Education (2013), found increase in communication between schools and parents of US students. A research in Korea by Kang and Cho (2014) found communication and information exchange between parents and teachers by smartphone application to be increasingly getting diversified and smartphone as a medium of communication is making a considerable contribution to mutual information exchange. UNESCO (2012) reported how mobile phones play an important role in emerging social movements in Middle East. It also

highlighted the potential of mobile technologies and social media to facilitate communication and collaboration on a massive scale.

A survey conducted by Gallup (2011) found 87% of young Arabs aged 15 to 29 had access to mobile phones in 2010, an increase from 79% in 2009. In the Gulf Cooperation Council (GCC) countries like UAE and Qatar, the mobile phone penetration rate is more than 100 percent. According to the latest ITU report (2018), Libya has 121.72 mobile subscription per 100 inhabitants and one of the cheapest mobile broadband subscription rate in the middle east. However, despite the prevalence of mobile communication systems in Libya, schools in Libya have not shown commitments to adopt mobile communication systems to conduct interactive communication between families/guardians of the students and the schools. Lack of proper communication from schools to parents/guardians is a common complaint among the parents/guardians of the students in Libya. Most often parents/guardians do not receive information about their children academic performances, attendance, disciplinary issues/other matters of concern in a timely manne. Despite the tremendous popularity of Mobile Communication Systems in Libya, they are not utilized by schools and parents/guardians as a medium of communication to enhance the student learning environment.

This study aims to discuss mobile communication systems adoption in Libyan Secondary Schools and in accordance with Libyan cultural context. The sections are designed as follows: Section 2 discuss mobile communication systems in Libya and Arab countries and their usage in education; Section 3 focuses on discussion of popular adoption theories; Section 4 presents the review of culture theories and Section 5 concludes and point towards future research directions.

## **2. MOBILE COMMUNICATION SYSTEM.**

### **2.1 Definition**

Zaki (2013) defined mobile communication system as “a telecommunication infrastructure serving users that are on the move (i.e., mobile). The communication between the users and the infrastructure is done over a wireless medium known as a radio channel. Telecommunication systems have several physical components such as: user terminal/equipment, transmission and switching/routing equipment, etc”. Piyatissa et al., (2018) noted that mobile communication systems and other digital devices could facilitates student’s comprehension and excellence of students of traditionally tough subjects such as chemistry and physics

### **2.2 Mobile Communication Systems in Arab Countries**

Reliable infrastructure for fixed phone lines as well as friendly regulatory environments and global market penetration has encouraged speedy growth of mobile telecommunications in developing regions (Uys et al., 2012, p. 579; ITU, 2018). The rapid acquisition of mobile technologies among the poorest nations enables people to create significant opportunities for economic growth, health care enhancement and increased access to education for people living in these countries (Andrews et al., 2011). Zuckerman (2009) has reported that from 80% to 90% of the public in some poor countries have at least minimal access to a mobile phone. In the Middle East region (excluding the North African countries) mobile penetration rates were anticipated to reach 93.9% in 2011 and 125.5% in 2015. In 2010, Iran ranked the single biggest mobile market, with 66 million subscriptions, followed by Saudi Arabia, with 42.9 million subscriptions. In the Gulf region, countries such as United Arab Emirates and Qatar, the mobile phone penetration rate is more than 100%. Even in poorer countries affected by war, like Palestine and Yemen, an increase in mobile phone penetration is expected in the next few years because of a growing youth market and emergence of new telecommunication operators (Muttoo, 2011; UNESCO, 2012). Cherrayil (2010) reported that the Palestinian market recorded the fastest growth in 2010, with mobile subscriptions increasing by 56%. The Arab region represents one of the fastest growing mobile phone markets in the world with mobile phone penetration being much faster than the Internet penetration (Muttoo, 2011). According to a study conducted by Gallup (2011), 87% of young Arabs aged between 15 and 29 reported having access to mobile phones in 2010, an increase from 79% in 2009.

Arab countries have utilized mobile phones to empower communities through various innovative mobile phone applications. For example, in Jordan, the Bedouin women consult doctors via mobile phones. Mobile phones have given these women the opportunity to ask for medical advice which has the potential to generate long-term positive impact on their health (Rhema, 2015). Another example, in Syria is an ‘Electronic Voucher System’ which was implemented in 2009 to alleviate food insecurity among Iraqi refugee families in Damascus. Through this programme, Iraqi refugees receive vouchers on their mobile phones to purchase food items from government-owned

stores (Muttoo, 2011). They were effectively used to bring people out into the streets for demonstrations in Arab spring (Muttoo, 2011).

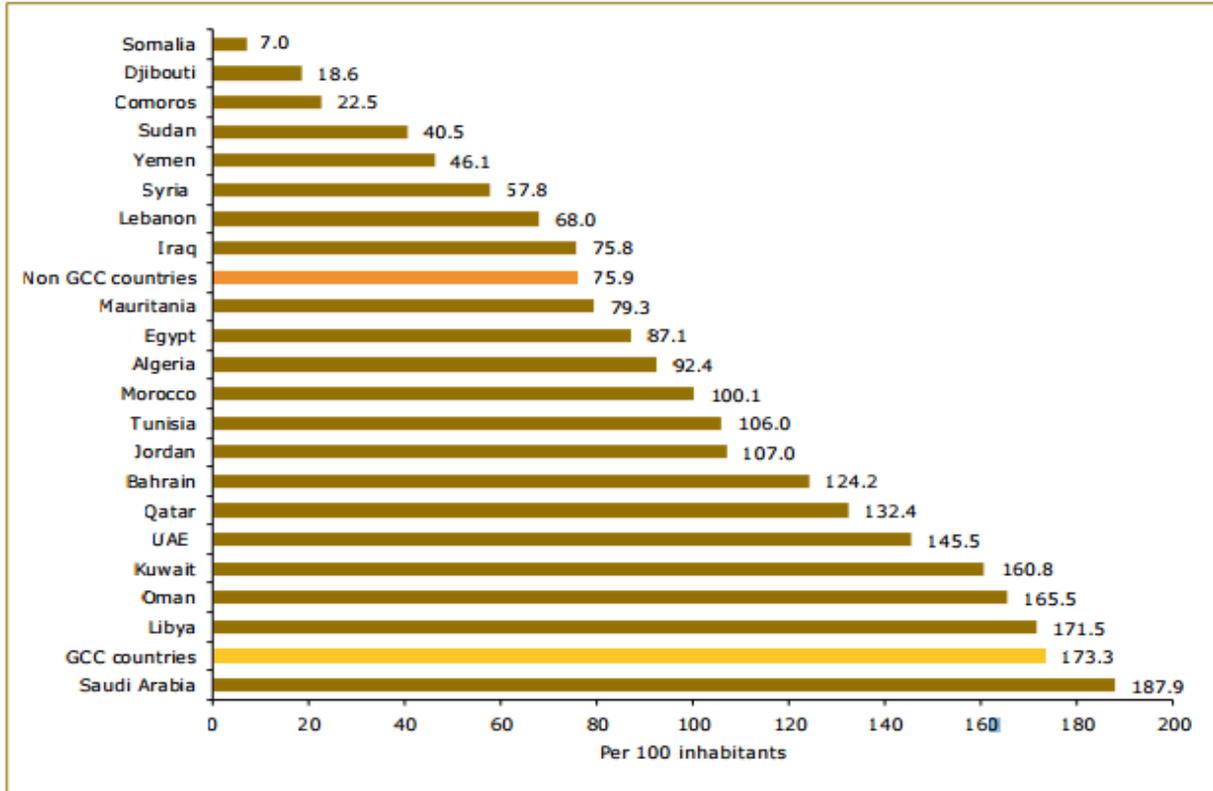


Fig 1. Source: ITU World Telecommunication/ICT Indicators database (2017)

### 2.3 Mobile Communication Systems in Libya

Over the last decade in Libya, mobile phone penetration in Libya has increased considerably, from 1% in 2001 to 171% in 2010. Currently, there is 121 mobile phone subscriptions per 100 inhabitants and Libyan broadband rate is one of the cheapest in the middle east.(ITU,2018).Libya’s government leveraged mobile-broadband technology in order to compensate for the lack of fixed infrastructure. In 2010, there were nearly 10.9 million mobile-cellular subscriptions and 2.7 million active mobile-broadband subscriptions in the country (ITU, 2012). The 2011 armed conflict in Libya completely transformed every aspect of daily life, including communication and Libya Telecom and Technology (LTT) services. It halted progress in the country and set back the gains built up over generations, disrupted economic growth and advances in nutrition, health, housing, education and employment (Rhema, & Miliszewska, 2012). Even before the recent instability, Libya’s ICT networks, projects and adoption have remained poor in relation to its counterparts (in terms of national income). This is mainly because of a political environment in which the ICT market has been controlled by a state-owned monopoly, except for mobile-cellular (voice) services, where two state-owned operators are competing with each other. In October 2011, LTT started its reconstruction and maintenance work and carried out technical operations to reinstate their services in the affected areas such as Misurata and Bani Waleed. LTT has set February 2012 as the deadline to return the service to its state prior to the Libyan revolution (ITU, 2012). Information and communications technologies (ICTs) and mobile phones have played a vital role in facilitating the communication and organization the Libyan revolution which took place on 17th of February 2011 (Libyan Ministry of Communication and Informatics, 2012; Jones et al., 2012). According to Jones and colleagues (2012), extensive cellular coverage and high rates of cell phone use in Libya suggest that mobile devices have a promising role to play in election monitoring. With donor support, the shared Network for Election Monitoring (SNEM) could implement a reporting system based on mobile technology, allowing observers to submit data directly via SMS (Jones et al., 2012).

## **2.4 Educational Use of Mobile Communication Systems in Arab Countries**

In Arab countries, mobile learning is still in its initiation phase. However, some universities have already adopted the Short Message Service (SMS) for teaching and learning in Saudi Arabia. For example, King Saud University has recently initiated a new service that offers users the ability to send text messages directly from a personal computer to a mobile phone (Altameem, 2011).

Muttoo (2011) opined that the use of an innovative ‘voice recognition’ mobile technology in Morocco to connect illiterate job seekers with prospective employers by Souktel-a nongovernmental organization (NGO) to enable the illiterate unemployed youth to upload their voice CVs or resumes and send them to employers is one of the many recent examples to show that the use of mobile phones in Arab countries, as in the rest of the world, is no longer about just making calls but increasingly about utilizing mobile phone applications for positive societal changes. Mobile phones have now emerged as a new tool to facilitate socioeconomic development and for political mobilization in Arab countries.

Arguably, the Arab Spring ranks among the most significant informal mobile learning phenomena in 2011. Thousands of youth used social media – accessed via their mobile phones – as a space for self-identification, self-assertion, contestation and mobilization around democracy, human rights and civil liberties. This review also uncovered evidence of the ways in which young people in the region are defining their identities through the integration of mobile phones in their daily lives (Shah and Jansen, 2011; UNICEF, 2011).

Sarrab et al.,(2016) pointed out that in spite of a considerable mobile and network penetration, several findings in the Middle East region have revealed that stakeholder lacks awareness and potential benefits related to M-learning. The educational institution must have proper infrastructure for a proper deployment of M-learning solutions (Khan et al., 2015).

The ideas and concepts of M-learning have begun to become popular in different education sectors and learning environments. M-learning helps to reduce the traditional training infrastructure and simplifies the learning process. It enhances a new dimension for learner–instructor interaction thus improving the accessibility, interoperability, and reusability of educational resources and a positive attitude among the learners towards learning (Manoj & Jayesh, 2014). In order to deliver adequate M-learning services, it is essential to examine the learner’s adoption process of M-learning (Liu, 2008). There are technical and non-technical constraints in M-learning adoptions. The technical constraints include communication infrastructure, software application and content customization while the non-technical consists of operational feasibility, trust, awareness, training, cultural norms and financial support (Liu et al., 2010).

### **2.4.1. Mobile Communication Systems in Education in Libya**

In Libya, online education is considered one of the most important factors in successfully building a new Libya, mobile-broadband technology is offering much more accessible and affordable alternative to the expensive and unreliable land-line infrastructure (Rhema, & Miliszewska, 2012; ITU, 2017). Using mobile phones as a platform for e-learning where content is delivered via text messages can be particularly useful at a time when the necessary infrastructure for the Internet connection does not exist. Mobile phones has the potential to enable increased access to education, broaden knowledge networks for students, improve availability of quality education materials, facilitate informal learning, and minimize the digital divide. Rhema, &Stensbur (2013) found Urban and regional engineering students reported quite high levels of use of their mobile phones to send text or MSM messages to support their learning. Again students from the urban university were more likely to use their mobile phones to access information or services on the web or send and receive emails, compared to their counterparts in the rural area. As would be anticipated, rural university students were less likely to use mobile phone functions that relied on the Internet connection. There was also a significant difference between female students and their male counterparts with respect to sending text or MSM messages for learning; male students were more likely to use this tool.

## **3. ADOPTION THEORIES**

The different adoption theories such as the Diffusion of Innovation (DOI) theory, the Unified Theory of Acceptance and Use of Technology (UTAUT), Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM),

DOI, UTAUT are described below. These theories are widely in educational use of Information Technology (eg. Md Gapar, 2011; Yatigammana et al,2014; Lashayo & Johar, 2018a; Lashayo & Johar, 2018b).

### 3.1 Theory of Reasoned Action (TRA)

TRA, which is originally drawn from social psychology, is one of the most influential theories in the behavioural and social sciences and information systems (Sheppard, Hartwick, & Warshaw, 1988; Venkatesh, et al., 2003). As shown in Figure 3.1 below, TRA is concerned with predicting behaviour on the basis of the posited associations between behaviour, behavioural intentions, and attitudes. One of the most significant tenets of TRA is the proposed relationship between behavioural intention and behaviour. Behavioural intention is defined as a “person’s subjective probability that he or she will perform some behaviour” (Fishbein & Ajzen, 1975). Behavioural intention is determined by the attitude towards behaviour and subjective norm. The attitude towards a behaviour is a bipolar (positive or negative) feeling about performing a behaviour (Fishbein & Ajzen, 1975). A subjective norm is “a person’s perception that most people who are important to [her or] him think [she or] he should or should not perform the behaviour in question” (Fishbein & Ajzen, 1975, p. 302). TRA suggests that attitudes, whether positive or negative, arise as a result of beliefs about the perceived consequences of a given action or behaviour. A subjective norm is more related to a person’s motivation or normative beliefs about complying with the perceived normative standards (Ajzen, 1991; Fishbein & Ajzen, 1975). In technology acceptance research, the use of TRA has been prevalent, whether it is used directly, as a basis for explaining acceptance, or used as a springboard to advance new models or theories (Venkatesh, et al., 2003).

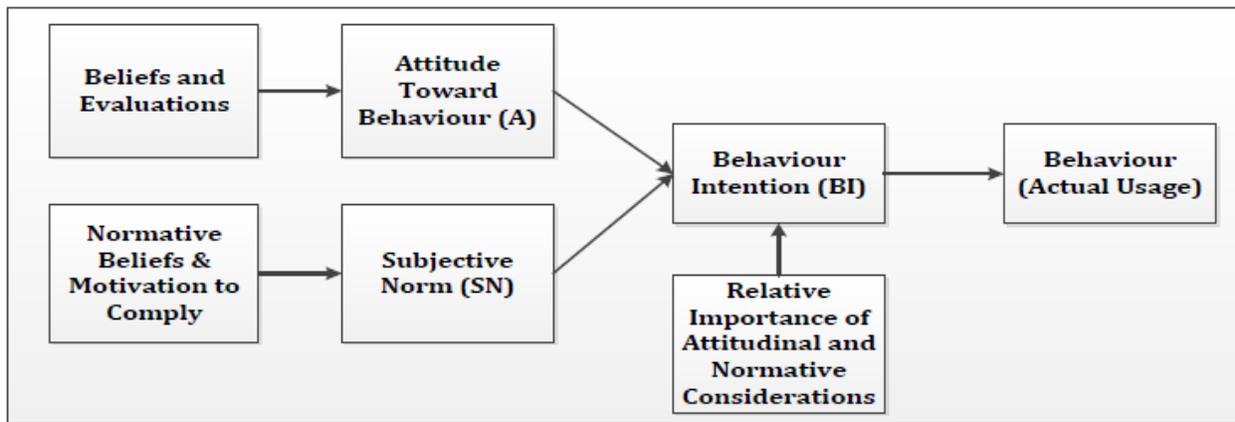


Fig 3.1. Theory of Reasoned Action (TRA) by Fishbein & Ajzen, (1975, p. 288).

### 3.2 Theory of Planned Behaviour (TPB)

The importance of TRA and TPB resides in their applicability to a variety of settings and their successful projections of behavioural intention and behaviour (Ajzen, 1991; Taylor & Todd, 1995). TPB is a descendent of TRA where there is always a need to provide a more detailed explanation for the complex human behaviour (Ajzen, 1991). Figure 3.2 illustrates the addition of the construct of perceived behaviour control, which influences both behaviour, and behavioural intention and the addition of the correlations between the antecedents of behavioural intention. Perceived behavioural control represents the extent to which “the resources and opportunities available to a person dictate the likelihood of behavioral achievement” (Ajzen, 1991, p. 183). The Decomposed Theory of Planned Behaviour (DTPB) is an adoption of TPB to the field of information systems (Taylor & Todd, 1995). The main components of TPB (attitudes, subjective norms, and perceived behavioural control) are decomposed into other related factors. Attitude was influenced by relative advantage, complexity and compatibility, subjective norms was influenced by normative influences and perceived behavioural control was influenced by efficacy and facilitating conditions (Taylor & Todd, 1995). DTPB was also influential in the emergence of widely cited theories such as UTAUT (Al-Gahtani, et al., 2007; Venkatesh, et al., 2003). DTPB was not only an extension of TPB, but also of TAM, which is discussed in the following section (Taylor & Todd, 1995).

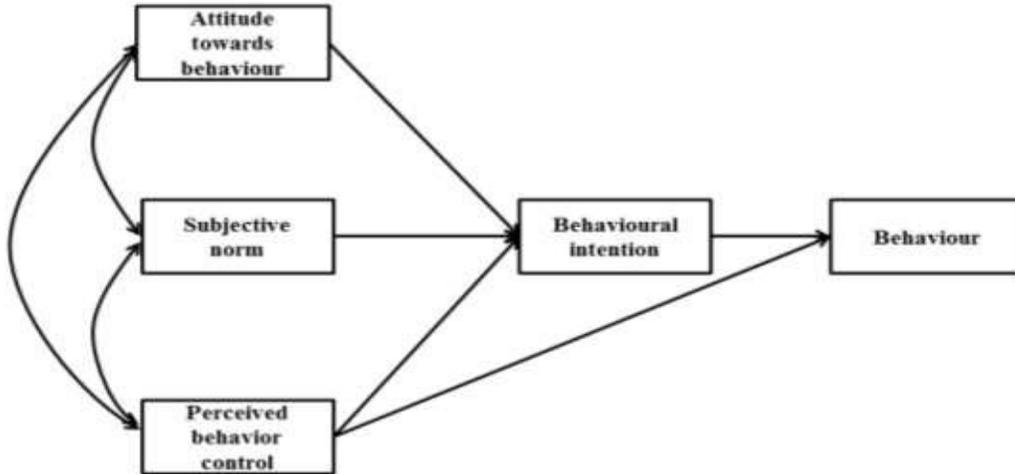


Fig 3.2 Theory of planned behaviour (adapted from Ajzen, 1991, p. 182).

### 3.3 Technology Acceptance Model (TAM)

Among the different approaches concerning the adoption of new technology, a major approach in the field of information systems is the Technology Acceptance Model (TAM) (D’Angelo & Little, 1998; Davis, 1989). TAM is an adaptation and technology oriented contextualisation of the social psychological TRA (Davis, 1986; Fishbein & Ajzen, 1975). The majority of the research on TAM (Gefen, et al., 2003; Moon & Kim, 2001) has been conducted on organisation employees’ perceptions of technology. Nonetheless, Burton-Jones and Hubona (2005) concluded that the TAM constructs are insignificant in determining system usability. Lu, Yu, Liu, and Yao (2003) argued that the TAM, as a result of its generality, is unable to provide detailed information on users’ opinions of a system. Another major criticism mentioned by Legris et al. (2003) is that TAM should have included social and organisational factors which are considered the most important factors for determining technology acceptance.

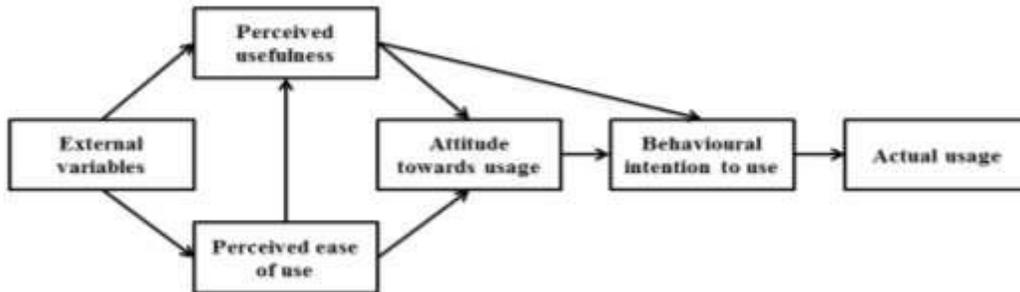


Fig.3.3 TAM model (adapted from Davis, 1986, 1989).

TAM continued to be extended and developed (Venkatesh & Brown, 2001), and eventually included the influence of utilitarian and hedonic outcomes perceptions, until it reached the current UTAUT form, which is considered in the next section. Nevertheless, it should be noted that McCoy, Galletta and King (2007) indicated that TAM does not fully apply for individuals who scored highly in Hofstede’s (1980) cultural dimensions of uncertainty avoidance, power distance, masculinity and collectivism. This raises many questions regarding the influence of culture on technology acceptance, at least in Libyan society cultural context. Researchers like (Md Gapar, 2011) 2014) used it to measure its role in ecommerce system acceptance and (Yatigamma et al, 2014) and compare e-learning acceptance between Malaysia and Sri Lanka.

### 3.4 Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)

The UTAUT was developed as a comprehensive and integrated model for better investigating user’s acceptance of new technology or system. Venkatesh, identified three types of prediction ratio of technology acceptance and they

are; firstly, culture and population, secondly adding different concepts to the model to expand the theoretic relationships of UTAUT and thirdly type to synthesize new predictor of variables into the UTAUT. Despite the integrated model in which some variables are usually added, Venkatesh et al.(2012) stressed the needs to add important predictor variables which could be applied within the technology use context of the user. They also investigated individual behavioral studies relating to consumers and changed the previous perspective (from organizations to individuals) by modifying the initial UTAUT model to add and strengthen a new prediction framework. The new framework is named as UTAUT2. Hedonic motivation construct was regarded a salient predictor and was added into the UTAUT2 to provide better stressing utility. Price value construct was also integrated in UTAUT2 model as cost, product quality and price affect adoption decisions. Venkatesh et al. (2012) also considered the roles of behavior intention in recent studies and therefore integrated habit as a new construct into the UTAUT2. These new added constructs continues to be validated and tested verified by many researches as vital factors determining users' technology acceptance.

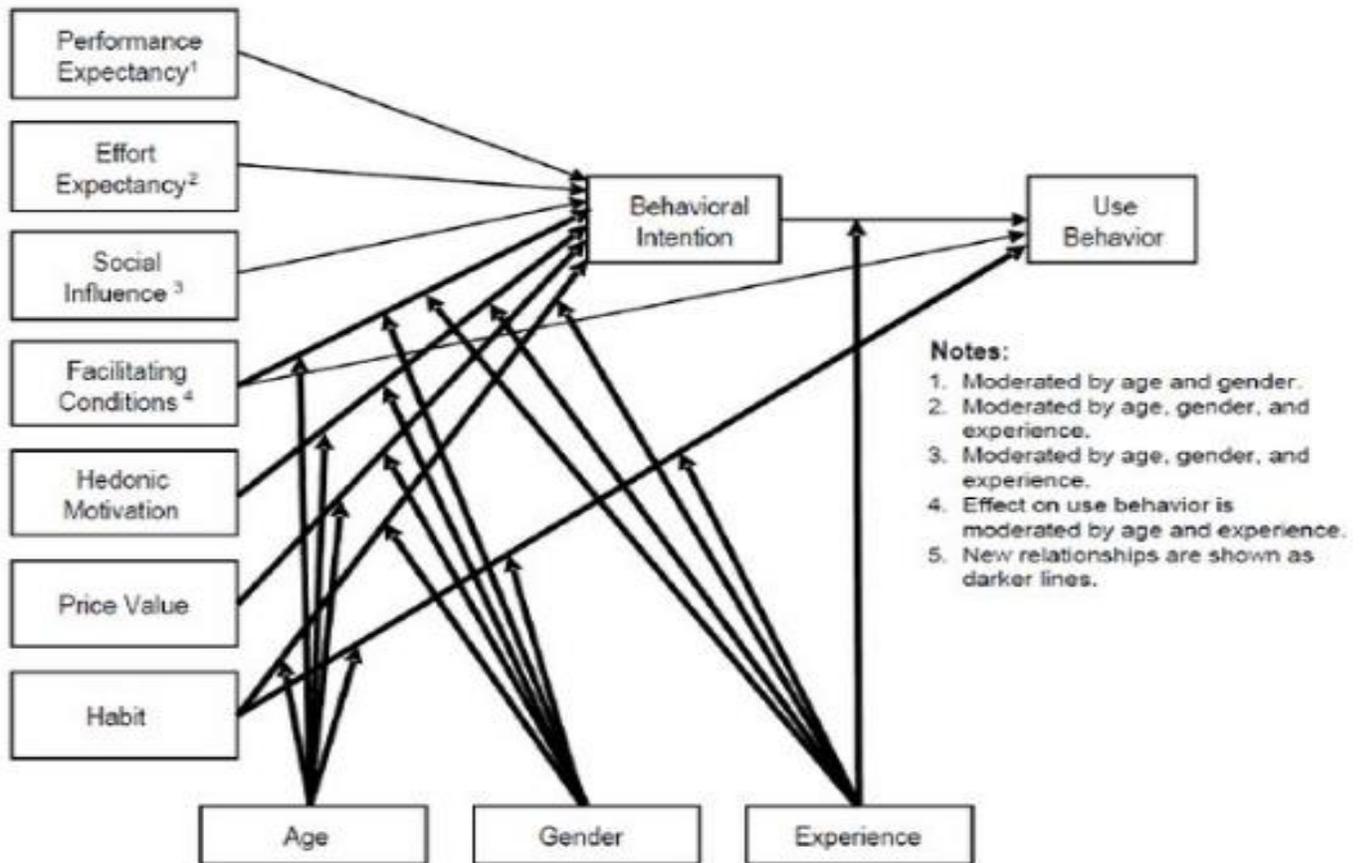


Figure 3.4 UTAUT2 taken from Venkatesh et al. (2012)

### 3.5 Diffusion of Innovation (DOI)

Rogers (2003) conceptualized the process of innovation acceptance and distribution by creating a framework that includes definitions and attributes of DOI. Rogers (2003, p. 5) defined diffusion as “the process in which an innovation is communicated through certain channels over time among the members of social system,” adding that “an innovation is an idea, practice, or object that is perceived as new by an individual or other unit of acceptance”. DOI has four elements derived from the definition of the diffusion process, namely “(1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system” (Rogers, 2003, p. 11). According to Rogers, (2003), in the DOI model, the evaluation of an innovation is based on the five attributes of relative advantage, compatibility, complexity, trialability, and observability. Rogers (2003, p.229) defined relative advantage as “the degree to which an innovation is seen as being better than the idea it supersedes”; compatibility as “the consistency of an innovation to a potential adopter’s needs, past experiences, and values”; trialability refers to

“the opportunity offered to potential adopters to try out the innovation on a limited basis, complexity refers to whether the innovation satisfies the basic needs of potential adopters’ and is in line with their social norms, values, and belief systems” while observability refers to “the ability of potential adopters to observe the impacts of using the new innovation on others before they make their own adoption decision”, compatibility refers to “whether the innovation satisfies the basic needs of potential adopters’.

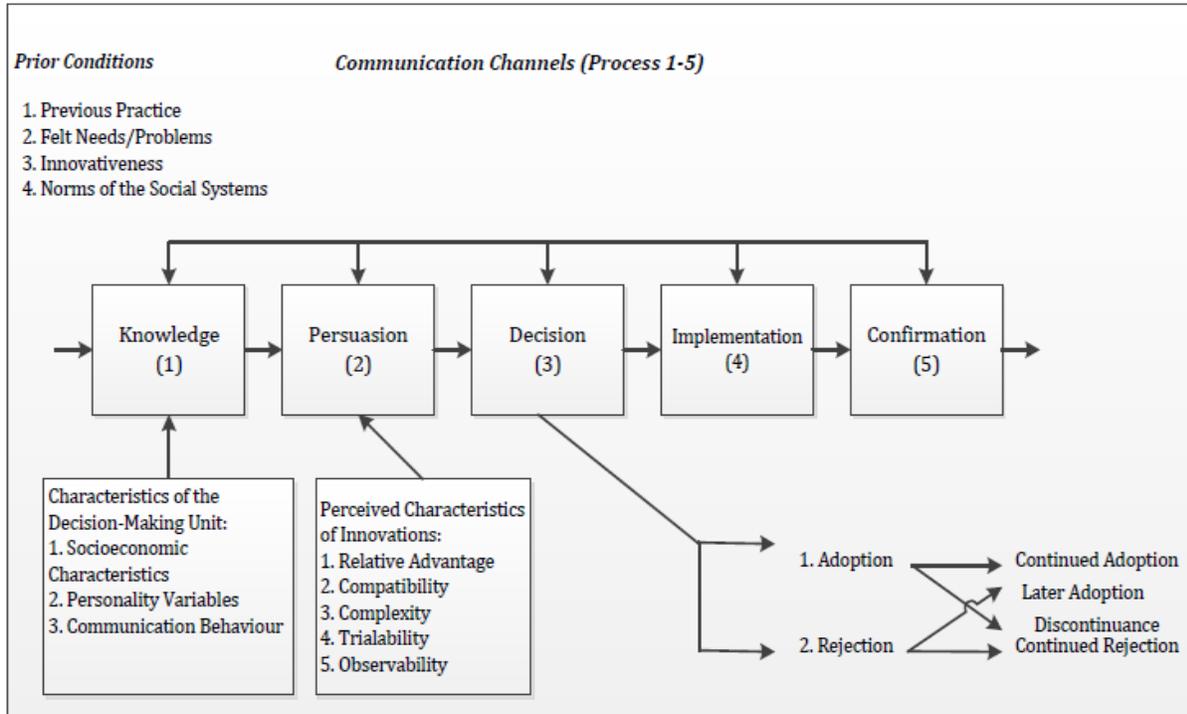


Fig 3.5. Innovation & Diffusion model by Rogers (1995)

#### 4. CULTURE

Oxford Dictionary (2019) defined culture as “the ideas, customs, and social behaviour of a particular people or society”. Hofstede (1980) defined culture as “a software of the mind that differentiates member of one group or group of people from another”. Geertz (1963) also gave a definition of culture as “an historically transmitted pattern of meaning embodied in symbols, a system of inherited conceptions expressed in symbolic form by means which men communicate” Ferraro (1995) offered a simple definition of culture as “everything that people have, think, and do as members of a society.”

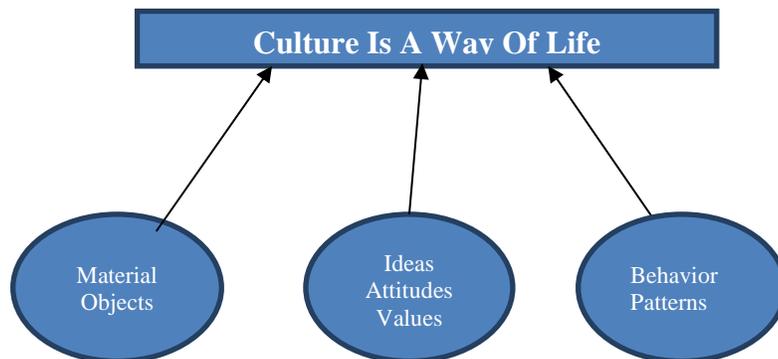


Fig1. Dimensions of Culture as adopted from Ferro, (1995)

#### **4.1 Categories of Culture**

Ferraro (1995) also categories culture as topical culture, historical culture, normative culture, mental culture and structural culture: Topical culture consists of everything on a list of topics, or categories, such as social organization, religion, or economy; historical culture is social heritage, or tradition that is passed on to future generations. Behavioral culture is shared, learned human behavior, a way of life the total way of life of a people. Normative culture is ideals, values, or rules for living a way of thinking, feeling, and believing. Functional culture is the way humans solve problems of adapting to the environment or living together. Mental culture is a complex of ideas, or learned habits, that inhibit impulses and distinguish people from animals and structural culture which consists of patterned and interrelated ideas, symbols or behaviors. Symbolic culture is based on arbitrarily assigned meanings that are shared by a society.

#### **4.2 Cultural Values**

Cultural values have been the main element and distinctive feature of culture for many scholars (Hofstede, 2001a; Hunt & At-Twajri, 1996; Srite & Karahanna, 2006; Zakaria, et al., 2003; Zhang & Maruping, 2008). Schwartz and Bardi (2001) argued that many factors determine the values of individuals. Values are prioritised based on enculturation, social locations, personal experiences, and genetic heritage (Schwartz & Bardi, 2001). Straub et al. (2002) stressed the role of values in shaping culture, claiming that culture is a representation of core values. They also stressed on the influence of core values on technology adoption. Rokeach (1973) defined cultural values as “an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence. A value system is an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance” (p. 5). According to Kluckhohn (1951), a value refers to “a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means and ends of actions” (p. 395). Schwartz et al. (1997), in citing and synthesizing Kluckhohn’s (1951) and Rokeach’s (1973) definitions of values, stated that values are “desirable, trans-situational goals, varying in importance, that serve as guiding principles in people’s lives” (p. 6). Hofstede (2001a, p. 6) described values as feelings that have positive or negative indications and argued that values address a number of psychological concerns such as : Evil versus good, dirty versus clean, decent versus indecent, ugly versus beautiful, dangerous versus safe abnormal versus normal, irrational versus rational, moral versus immoral and paradoxical versus logical. Values are gained (Karahanna, Evaristo, & Srite, 2005) or mentally programmed (Hofstede, 2001a) mainly through family, education, and social environment. Moreover, values are mostly, but not completely, acquired at an early stage of life and provide basic assumptions about life and how the world is perceived.

#### **4.4. Cultural models**

There are many models of culture which focus on different values and present them as the most relevant and important (Leidner & Kayworth, 2006). Examples are Trompenaars’ Cultural Dimensions (1998), Triandis’ Cultural Syndromes (1994), Hofstede’s (1980) National Cultural Dimensions, and Schwartz’s Basic Human Value theory (1992, 1994b). Trompenaars and Hampden-Turner (1998) created their cultural model based on cultural issues of business and management executives. Categorising culture as a combination of behavioural and values patterns. The focus of Trompenaars and Hampden-Turner (1998) were on dialectic opposites of cultural values, namely universalism versus particularism, specificity versus diffuseness, affective versus neutral relationships, achievement versus ascription, and internal versus external control. These cultural values are used to solve problems that are related to the environment, relationships with others, and time (Trompenaars, 2006). Trompenaars and Hampden-Turner’s (1998) cultural dimensions are extensive in describing culture, but they are not exclusive (for instance, attitude to the environment and individuality are very similar to each other). However, in terms of applying these concepts and testing them in reality, they significantly lacked the simplicity and precision in describing behavior (Abu Nadi, 2014).

Triandis’ (1994) Cultural Syndromes, is another cultural model. Triandis’ defined culture “as a set of human-made objective and subjective elements that in the past have increased the probability of survival and resulted in satisfaction of the participants in an ecological niche, and thus became shared among those who could communicate with each other because they had a common language and lived in the same time and place”. The four cultural syndromes of tightness, complexity, individualism, and collectivism (Triandis, 1994) was in the original model. Vertical versus horizontal, active versus passive, universal versus particular, ascription versus achievement of status, diffuse versus specific, instrumental versus specific, and emotionally expressive versus suppressive were added in his subsequent model (Triandis, 2001).

The issue with Triandis syndromes is that there are no provisions for a specific methodology and measurement guidelines, Abu Nadi, 2014 and not completely developed in terms of operationalization and instrumentalization (Chanchani & Theivananthampillai, 2002).

Yet, Hofstede's research (1980, 1997, 1998b, 1999, 2001a, 2001b) is very popular and widely accepted in IS literature (Tarhini, 2015). Hofstede established the four overall dimensions of uncertainty avoidance, power distance, masculinity vs. femininity, and individualism vs. collectivism to explain the differences between the respondents. This explained the variations between half of the respondents.

With the help of Michael Bond (Hofstede & Bond, 1988), a fifth dimension called "time orientation" or Confucian dynamism was added. To explain Asian values, the fifth dimension was added. Because of their simplicity, precision, and strong explanation of cultural differences and because of the size and scope of the distributed surveys, Hofstede's dimensions were used as a basis for many studies. Yet there are some critics on the theory (Gould, 2005). Gould (2005) summarized the critiques of Hofstede's dimensions, which covered the following three issues: Hofstede's dimensions, explains culture at national level and focuses work values.

The theory of the Basic Human Values (BHV) was an original idea of Schwartz and Bilsky (1990) for recognition and categorization of values are guided by principles that are present in all cultures. Schwartz believed that these values are universal and common values were created to consist all essential values known in all societies around the world (Schwartz & Bilsky 2003, 1990, Schwartz, 1992). The relation between the comprehensive core values and the structure are defined by the model (Schwartz et al., 2001). The theory is continuously validated by Schwartz and others until clear view of a universal typology of values are attained (Schwartz, et al., 2001). The BHV theory has been extensively used in the sociology psychology disciplines and is deeply rooted. According to Alkindi, (2009), Schwartz's BHV is a comprehensive theory which can explain national and individual values. Unlike Hofstede's dimensions, Schwartz's theory of Basic Human Values explains culture at both the individual and national level and focuses on human values rather than work values.

#### **4.5. Arab Culture**

Arab culture refers to the culture of all the people in the region extending from the Atlantic coast of Northern Africa to the Arabian Gulf. The culture refers to people who commonly speak Arabic language and a shared sense of geographic, historical, and cultural identity. UNDP (1993), projected the total the total population of the Arab world to be approximately 230 million in 22 nations. Despite the national boundaries drawn between the Arabs in the post-colonial period, the Arabs on the popular level view themselves as a unified entity. Arabs are not homogeneous with respect to religious belief, but include Christians, Jews, and Muslims. The large majority of Arabs are Muslim (92%), however, in total the Arabs comprise only about 17% of the Islamic population worldwide (with other substantial populations in Indonesia/Malaysia, South Asia, Iran, Central Asia, Turkey, and Sub-Saharan Africa). The religion of Islam is connected with Arab identity because Islam originated from the Arabian peninsula and Arabic language is the sacred language of the Holy Qur'an. There are minority groups living within Arabic countries with their own unique cultures. Differences within Arabic culture also exist between those from urban versus rural areas. (Arab Community Center for Economic and Social Services, 1999). Although Arab Culture is made up of an expanded area dominated by Arabic language, Sunni Islam and ways of life founded on the patriarchal type of family, the Arab World does not consist of a uniform setting. In fact, each region has distinctive features due to the preservation of an ancient cultural foundation. The sub cultural areas of the Arab World are the following: The Fertile Crescent (Lebanon, Syria, Iraq, Jordan and Palestine); Arabian Peninsula (Kuwait, Qatar, Bahrain, Saudi Arabia, Oman, Yemen) and the Maghreb (Libya, Tunisia, Algeria, Morocco) (UNESCO, 2001).

The cultural and judicial sources of diverse populations of Arabs are broadened by the religious and ethnic complexity of the Arab World. In addition to this cultural differences, the countries of the region are engaged in the development process at different pace. (UNESCO, 2001)

UK Government Report (2016) found that Arab cultures place great value on education and literacy, and both are intimately connected with the status of an individual and his or her family. It is considered demeaning, even shameful, to engage in occupations for which one is considered to be overqualified. )

#### **4.6 Libyan Culture**

Libya is in North Africa between Tunisia and Egypt with the Mediterranean coast as its northern border. More than 90% of the country is semi desert prone to dust and sandstorms. Libyan ethnicity is made up of 97% of Berber and Arab, while the remaining 3% (includes Greeks, Maltese, Italians, Egyptians, Pakistanis, Turks, Indians, and

Tunisians). 97% of the population are predominantly, Christianity 1.5% and Other 1%. The official language the formal language is Arabic while Italian and English are widely understood in the major cities. (UN, 2001). Libyan culture, art and architecture are heavily influenced by Islamic religion. Libyan culture is dominated by Arabic language and Islamic teachings and way of life. The culture of Libya is predominantly Arab with large minority of Berber whose culture is different from the Arabs (UNESCO, 2001).

#### **4.7 Impact of Culture on ICT Use**

The study of culture originated from anthropology and sociology and has been used by many disciplines as an explanation of why people behave in particular ways (Davison & Martinsons, 2003). The literature has indicated the significance of studying the relationship between culture and technology. (AL-Shehry, et al., 2006; Warkentin, et al., 2002). Literature on technology acceptance and adoption has also shown that culture is a key determinant in the acceptance of technology (Leidner & Kayworth, 2006).

The influence of culture has become evident for many applied disciplines, including information systems and technology (Weerakkody, & El-Haddadeh, 2009; Davison & Martinsons, 2003). Additionally, scholars have found a significant correlation between cultural factors and the adoption of ICT (Erumban & de Jong, 2006; Zhang & Maruping, 2008), IS (Min, Li, & Ji, 2009; Twati, 2008) and IT (Srite & Karahanna, 2006). Many researchers have argued that the diffusion of technology across cultures occurs in a highly culture-specific manner (Al-Gahtani, et al., 2007; Erumban & de Jong, 2006; C. Hill, et al., 1994; Karahanna, et al., 1999; Straub, et al., 2003). Straub et al. (2003) posited that these differences in technology diffusion are due to the strong relation between culture and technology acceptance. In fact, Straub et al. (2003) explained that the success of technologies developed in one culture and then transferred to another requires more than just technical instructions. Given that culture is a collection of values and beliefs which differentiates one culture from another, culture affects how technological systems are designed and received. Therefore, lack of acceptance occurs because individuals carry cultural biases, beliefs, and values which affect their perceptions of the technology. Thus, understanding and communicating with the receiving cultures would enable a better and more successful transfer of technology systems (Straub, et al., 2003). Espoused cultural values are considered a powerful explanation of the socio- psychological phenomenon of technology acceptance (Carter & Weerakkody, 2008; Al-Gahtani, et al., 2007; Srite & Karahanna, 2006; Ford, Connelly, & Meister, 2003; Straub, et al., 2003; Zakaria, et al., 2003). Hence, before studying this relationship, a better understanding of culture is required and is explored in the following section.

#### **4.8 Designing Mobile Communication Systems In Libyan Cultural Context**

Since culture is also defined as “the collective programming of the mind that distinguishes the members of one group or category of people from another” (Hofstede, 1980, p. 25). Thus, people’s perceptions of Mobile Communication Systems differ, depending on their surroundings. Accordingly, the design of mobile communication system needs to consider cultural differences and sensitivities of its users; this includes consideration for the various dimensions of the e-learning environment (Khan, 2003). Cultural factors are increasingly cited as significant influences on IT adoption (Elbeltagi et al, 2005). In Libyan culture for example “thumbs-up” sign signifies approval, whereas in some other cultures, such as Bangladesh, it is used to challenge people. Another example is an eye-to-eye contact which is often avoided in Libya and other Arabic cultures as a sign of respect and humility which is an important aspect of the Islamic religion. However, in Western societies, avoiding eye contact might be interpreted as a sign of submission and weakness and.

The system to be designed for usage in Libya, should consider appropriate reading directions; right-to-left to suit the Arabic language. Likewise, text justification and navigation systems should be fixed on the left hand side. In addition, the choice of icons, symbols, objects and colours needs to be carefully considered. For example, many users in the Western countries will find an image of a pig or dog on a Web page harmless, or indeed friendly, whereas users in Libya would find a similar Web page quite offensive. Libyan families are still mostly traditional in their customs, attitudes, behaviours, and interaction and communication patterns and protocols. Therefore, a Libyan family has a limited ability to follow the developments in ICTs, embrace them, and influence the attitudes and behaviours of their children.

### **5.CONCLUSION**

This paper reflects on Mobile Communication Systems, adoption and cultural theories. It describes the telecommunication and mobile communications systems in Libya and other Arab countries. This paper provided the

necessary background on the adoption of Mobile Communication Systems and discussed popular adoption theories to identify the gap in the literature. Furthermore, the discussion included the definitions and criticisms of innovation and technology acceptance theories in the literature. Cultural values, models were presented too. Through the discussion, it was found that Schwartz's Human Values theory (specifically BPV) enables the study of the influence of values at the individual level. In a further attempt to understand the determinants factors that influence mobile communication systems adoption by parents/guardians of secondary school students and the staff of the schools in Libyan cultural context, a Phd research study is currently undertaken with the objective of studying the effect of cultural values on Mobile Communication Systems acceptance, studying how the perceived characteristics of mobile communication systems affect mobile communication acceptance, study how trust in internet affect mobile communication systems acceptance and to also investigate if perspective on communication could affect acceptance of mobile communication systems.

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