



## A PILOT STUDY ON ADOPTION OF MOBILE COMMUNICATION SYSTEMS IN LIBYAN SECONDARY SCHOOLS

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### ABSTRACT

To facilitate better communication between Libyan parents/guardians and schools and enhance better learning experience for the students mobile communication systems were proposed to be implemented using Libyan cultural context as a guide. This study adopted Abu Nadi's (2012) model to investigate the adoption of mobile communication systems while taking Libyan culture into consideration. Based on the research framework, model and research questions, hypothesis were developed, and sixty questionnaires were distributed and forty five of the questionnaires were successfully completed to do a pilot test of the questionnaire. Findings from the data analysis indicated that the constructs relevant to the context of the research are relative advantage, compatibility, complexity, result demonstrability, trust in the Internet, trust in government agencies, perspective on communication, and Schwartz's BPV.

## 1. Introduction

Information systems play a huge role in strengthening the relationship between schools and parents/ guardians. Usages of new technologies facilitate interaction between the parents/ guardians and their respective schools and this in return could help 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. It could be an effective method to assist students to improve and show significant achievement in the class. (Beleid and Jaharadak, 2019).

According to Beleid and Jaharadak, (2019), schools in Libya lack proper communication with parents/ guardians and it is a common complaint among the parents/ guardians of the students. Information about their children academic performances, attendance, disciplinary issues other matters of concern in does not reach parents/ guardians on time. And 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.

To understand and address this gap, this study adopt a model proposed by Abu Nadi (2012) to study factors affecting the adoption of mobile communication systems in Libyan Secondary Schools and in accordance with Libyan cultural context. This aim of this study is to pilot test the hypothesis that was driven from the adopted research model to establish their reliability and validity.

## 2. Methodology

To verify the understanding of survey questions by respondents, it is important to conduct pilot study. According to Kinchin & Edwards, (2018), *A pilot study helps researchers to test in reality how likely the research process is to work, in order to help them decide how best to conduct the final research study.* To help confirm the items, layout, clarity and instructions, and the suitability of types of response for closed ended questions, pilot study is very useful (Cohen, Mannarino, & Staron, 2006; Thabane et al., 2010). Therefore this study aims to test the hypothesis derived from the research framework and model.

Quantitative method was applied for this pilot study. Survey questions were developed to reflect the constructs specified in the model. About sixty Libyan parents, guardians and school administrators were approached to answer the survey questions. The questionnaire were designed in English but were translated in Arabic to enable the

participants to clearly understand the questions in their mother tongue. Forty five of the respondents completed the full survey and returned them to the researchers. The questionnaire was designed based on the hypothesis driven from the research model.

## 2.1 Research Framework

The framework below has been used as the basis to develop the research model. The framework consists of Perceived Characteristics, Perspective on Communication, Individual Cultural Characteristics based on Schwartz (2006) and Trust on Internet. The frame work and the model are adopted from (Abu Nadi, 2012). Who proposed, tested and successfully validated it in his thesis. The sections below will discuss the perceived characteristics of mobile communication systems that consists social influence, perceptions constructs and the perspective of communication constructs.

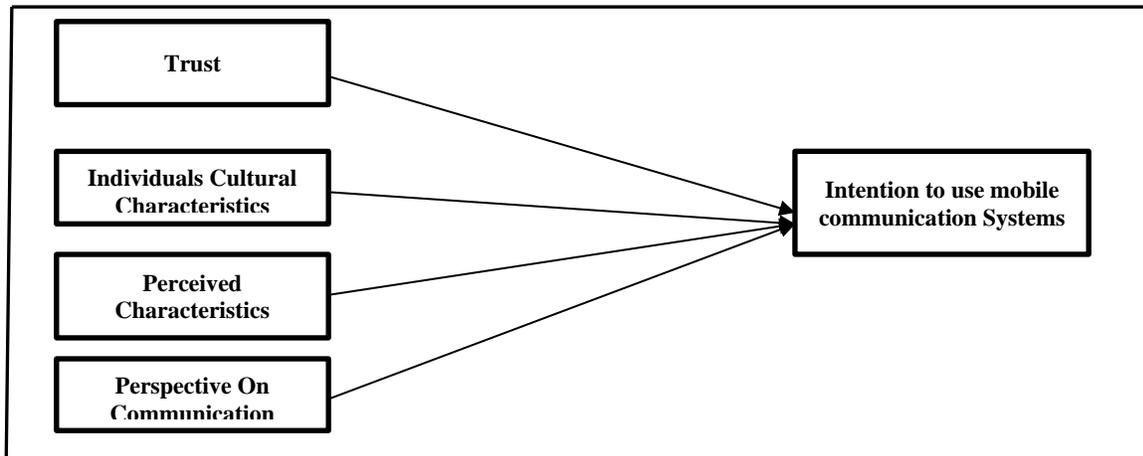


Fig.1 Research Framework

## 2.2. Research Model

The model adopted and to be used in this study was initially proposed by (Abu Nadi, 2012) which he applied, tested and validated in e-government acceptance of Saudi Cultural Context. The relationship between the three main components of cultural values, mobile communication systems, and their acceptance by Libyan educational authorities and parents/ guardians will be pilot tested with the research model and research hypotheses. Perceived characteristics of mobile communication systems are selected based on their relevance in the context of Libya culture. The research model incorporates empirically validated and frequently cited cultural and acceptance models found the literature according to their relevance to the current study. Abu Nadi (2012) selected elements of the model mainly from the Perceived Characteristics of Innovation (PCI). The cultural model is based on Schwartz's (2006) Basic Personal Values (BPV).

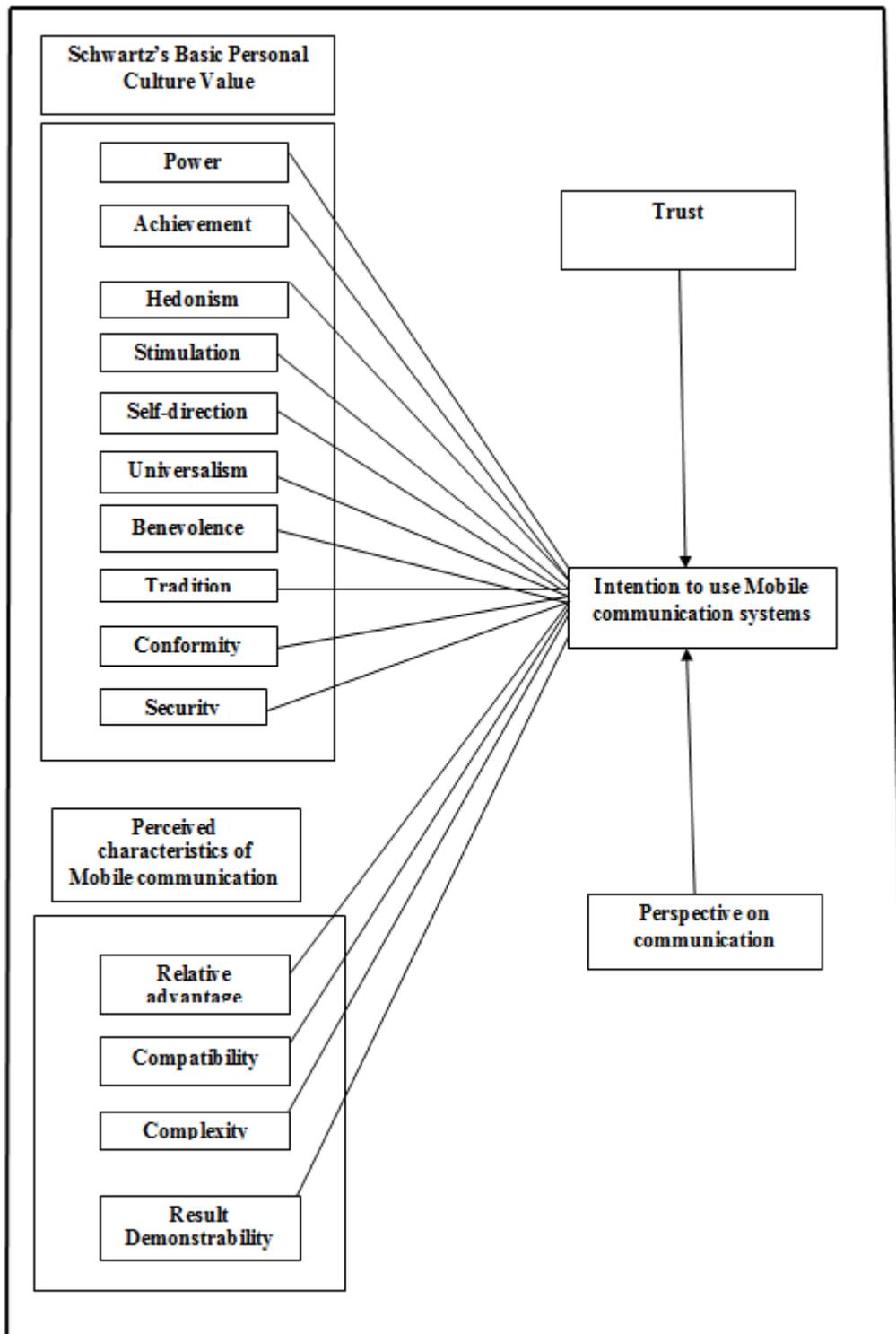


Fig 2. Research Model adopted from (Abu, Nadi, 2012)

### 2.3. Research Hypotheses

This research model combines Perceived characteristics of Mobile Communication and Schwartz's (2006) 10 personal values, which enabled addressing research questions. The resulting model was a combination from various entrenched models to enable thorough examination of Libyan Culture and mobile communication systems adoption. Thus, the model is considered as a significant contribution in the explanation of the influence of culture over technology acceptance within a developing country context (Libya). Figure 2 above illustrates the research model which is mainly based on Schwartz's Basic Personal Values (BPV) and Moore's and Benbasat's (1991) PCI. This model has extended PCI by incorporating cultural values and including trust, communication and social influence. The first research question 'How do perceived characteristics of mobile communication systems affect mobile communication systems acceptance?' will be answered by investigating the PCI elements (PCMS) of the research model and their relation with the acceptance of Mobile Communication Systems. The second question 'What cultural values influence the acceptance of Mobile Communication Systems is determined by examining the relation between Schwartz's BPV and transacting intention. The third question 'How does trust in the Internet and education agencies influence acceptance?' is answered by examining the hypothesized connection between trust with education agencies and the Internet and the intention to use mobile communication systems. The fourth question 'How does the social influence of existing mobile communication Systems users affect the acceptance of mobile communication Systems?' is investigated by examining the relationship between such communication acceptance and social influence. The fifth research question 'How does using mobile communication as a communication method affect acceptance of mobile communication systems?' is addressed by studying the connection between perspective on communication and acceptance of mobile communication systems.

Crane (2016) cautioned that while comprehensiveness is important when choosing all factors relevant to the context, irrelevant factors need to be eliminated as well. It is therefore important to note that the research model used in this study applies only to the specific context of Libya, as recommended by Seddon and Scheepers (2006) and Glaeser (2017) for information systems (IS) quantitative models.

Moore and Benbasat's (1991) PCI model was originally developed to "tap respondents' reactions in an 'initial adoption' environment where the individual acceptance decision is voluntary" (p. 194), which is also the case in this study. Moreover, PCI was chosen as this study focuses on understanding the differences between adopters and non-adopters. Further justification is that PCI was developed in a theoretically rich approach and was tested rigorously which should enrich the explanation of mobile communication systems acceptance (Moore & Benbasat, 1991; Plouffe, Hurland, & Vandenbosch, 2001).

The PCI model was developed to study individual-level acceptance decisions, which is also the focus of this study; nevertheless, the PCI instrument measures were applied at the organisational setting (Moore & Benbasat, 1991, Yatigammana, 2014). Therefore, many procedures were conducted to alter the definitions and measures used in the original study (Moore & Benbasat, 1991). These procedures are discussed in the next chapter. The following table presents a list of constructs borrowed from the relevant research. The constructs were redefined so that they fit better into the present research context.

#### 2.3.1 Schwartz Individual Cultural Values

Cultural values are associated with shaping and predicting behaviour (Schwartz, 2006). In the past, researchers studying Internet adoption (Dwivedi & Weerakkody, 2007, Zhu, 2015.) and ecommerce (Sait, et al., 2004, Dwivedi, 2014) have posited that cultural values strongly affect the adoption of these technologies. Therefore, it was expected that cultural values influence the acceptance mobile communication systems in Libya. As Libya, like other Arabian countries have a strong cultural identity (Tarhini, 2017). Self enhancement values (power and achievement values), in the sense of achievement within social expectations and authority in a collectivist and tribal culture, are gained through personal connections, power is gained from friends and family and success in utilizing social relations by gaining authority or prestige. As mobile communication systems are expected to remove face to face interaction between parents/ guardians and school authorities, and could compromise the loop of favours gained through social connections. Therefore, the following is hypothesized:

H1: Power has a negative significant impact on intention to use mobile communication systems

H2: Achievement has a negative significant impact on intention to use mobile communication Systems.

It was also expected that pleasure seeking, which is motivated by the hedonism value, would not be related to mobile communication Systems in Libya. Based on the previous discussion it is hypothesized that:

H3: Hedonism has a negative significant impact on intention to use mobile communication Systems.

Openness to change values (stimulation and self-direction values), i.e. related to novelty and independence, can be associated with mobile communication systems. Changing from the traditional methods of contacting the school authorities to using mobile communication systems should be positively related to the levels of novelty and independence of the respondents. Hence, the following hypothesis is constructed:

H4: Stimulation has a positive significant impact on intention to use mobile communication systems.

H5: Self-direction has positive significant impact on intention to use mobile communication systems.

Universalism and benevolence values are values linked with the collectivism parts of a society, and therefore are negatively associated with the use of mobile communication systems. The universalism value is concerned with sustaining the welfare of others and tolerance. As mobile communication systems could cause social isolation in their current forms and do not provide opportunities for citizens to interact with each other and enable the social aspects of this value, it was expected that universalism plays a negative role in the acceptance of mobile communication systems. The benevolence value is related to assistance and loyalty to others. Mobile communication systems disconnect this level of social interaction between citizens (Hampton et al., 2011). Therefore the following hypothesis is reached:

H6: Universalism has a negative significant impact on intention to use mobile communication systems.

H7: Benevolence has a negative significant impact on intention to use mobile communication systems.

Conservatism and affiliation with a tribe in Libya are some of the characteristic that has an effect in Libya in many ways (Dwivedi & Weerakkody, 2007). Hence, there is an expectation that values of conservatism (security, tradition and conformity values) strongly strong impact the acceptance of information technology in Libya. The value of security has an element of the exchange of favours which may be connected to the Arabic word *wasta* and this practice is regarded as a kind of favour exchanging within society (Smith, et al., 2011, Weir, 2016). The Arabic word *Wasta* very well resembles the meaning of the English word nepotism. Therefore, conforming to the rules of Libyan society and abiding with the tradition of *wasta* (tradition and security), therefore, there is an expectation that values of conservatism are negatively associated with mobile communication systems. Thus, it is hypothesised that:

H8: Traditional values have negative significant impact on intention to use mobile communication systems

H9: Conformity values have negative significant impact on intention to use mobile communication systems.

H10: Security values have negative significant impact on intention to use mobile communication system.

### 2.3.2. Trust in the Internet

In a traditional society such as Libyans a, trust is an essential determinant of usage of new technologies. Concern for using mobile communication systems to facilitate good communicating and interactions between schools and parents/guardians might impact its use. Libyans might not trust the Internet as a medium for the communication, especially since the providers are government agencies. Perceptions of trusting the Internet could influence the number of Libyans who might like to use Mobile Communication system, though the Internet is the medium upon which mobile communication Systems would be conducted, citizens might not accept the communication systems unless they are trusted. Internet Trust issues arises over the concern that data could be compromised .This lead to the following hypotheses that address the association between trust in the Internet and intention to use:

H11: Trust in the Internet has a positive significant influence on intention to use mobile communication systems

### 2.3.3 Perspective on Communication

Hakken (1991, as cited in Straub et al. (2003), argued that technology is an establishing factor of human communications and networks. Yet, online communication Systems does not allow the natural benefits of face-to-face communications (Harfouche,2010). In Libyan Culture, a significant part of meaning and information is conveyed implicitly within a conversation (Hall & Hall, 1990), it is important to study how usage of mobile communication systems affects their acceptance as a communication tool between school authorities and parents. However, Aoun et al. (2010) found that this construct positively influences intention of usage. Since this study focus on Arabic culture which is considered high context, it was expected that acceptance would be favoured perceive mobile communication as a suitable means of communication between all stakeholders. Thus, the following is hypothesized:

H12: Perspective on communication has a negative significant impact on intention to use mobile communications.

### 2.3.4 Perceived Characteristics of Mobile Communications Systems (PCMC)

Based on past literature, a set of constructs has been developed to aid in the development of a conceptual model that enabled the comprehension of mobile communication systems acceptance in Libya. This set of constructs provides a preliminary framework for the development of the research instrument. This framework, PCM different model, is used to develop a research model that explains and predicts mobile communication systems acceptance. PCMC is mainly based on Moore and Benbasat's (1991) PCI model, which is related to mobile communication systems acceptance in Libya. To synthesis different model into the creation of PCMC Crane's (2016) approach of balancing and choosing theoretical factors is used.

### 2.3.5 Behaviour Advantage and Compatibility

It might be important to consider the perceived relative advantages for Libyan citizens when intending to use mobile communication systems where current social traditional methods might be preferred. Additionally, it was expected that the higher the levels of compatibility of mobile communication systems with cultural needs, values, and previous experiences the higher the chances of their acceptance of would be. Al-Gahtani et al. (2007) suggested that acceptance of technology will be hindered if a given technology clashes with the individual's affinity for certain cultural values. In conservative cultures such as Libya, technologies developed in Western cultures are subjected to a process of selection. Technologies that best suit the adopting culture are selected based on the cultural values of that society. Hofstede (2010) emphasized that cultural context should be considered before implementing and accepting when accepting information Technology systems. As Libyan citizens are considered to represent a collective society that has developed many social norms in acquiring educational services (Alshaya, 2002; Bjerke & Al- Meer, 1993), one needs to investigate whether parents and school authorities consider mobile communication systems as a relative advantage over the use traditional methods, and whether mobile communication systems would be considered consistent with their needs, past experiences, and values and if these perceptions actually promote acceptance. This is examined by studying the hypothesized relationship between relative advantage and compatibility and intention to use mobile communication systems, as shown below:

H13: Relative advantage has a positive significant influence on intention to use mobile communication systems.

H14: Compatibility has a positive significant influence on intention to use mobile communication systems.

Hypothesis 13 and 14 are supported by studies such as (Carter & Weerakkody, 2008; Sang, Lee & Lee 2009). These previous researches has investigated these hypotheses and assured their importance in determining intention to use.

### 2.3.6 Complexity

The complexity of using novel technologies is a determining factor of acceptance for many people (Al-Ghatani, 2003; Mejias, Rogers, 2003). Mobile Communication Systems and other digital technologies are perceived to be complicated and difficult to use by many citizens around the world especially if citizens are not familiar with these services (Al-Gahtani, 2011, MdGapar, 2011). The novelty of Mobile Communication Systems for citizens is particularly the case for Libyan Citizens. Moreover, the high uncertainty avoidance in Arab citizens especially among Libyans raises issues concerning the perceived complexity of the technology (Al-Gahtani, 2011; Al-Gahtani, et al., 2007; Alshaya, 2002; Bjerke & Al-Meer, 1993). The complexity construct is aimed at measuring how citizens perceive the difficulty of Mobile Communication Systems. This hypothesis is supported by Carter and Belanger (2005) studies. The following is the research hypothesis for this relationship:

H15: Complexity has a negative significant influence on intention to use Mobile Communication Systems.

### 2.3.7 Result Demonstrability

The extent to which the benefits of Mobile Communication Systems are perceived to be sharable, communicable, tangible, or observable might influence the actual intention to conduct a communication between schools and parents (Hussein et al. & Mahmud, 2011, Lashayo, 2018). Taking these perceptions further, it was expected that citizens would communicate the results of their transactions to determine whether these services are useful. This is particularly important for the nurturing, collective cultures where the sharing of positive experiences by word of mouth is a significant factor in determining usage. Although the issue of influencing others might be more closely related to the construct of social influence than the construct result demonstrability. Thus, it is expected that perceptions of result demonstrability of mobile communication systems will promote intention to use them, whether these perceptions come from the individuals themselves or from the society. This hypothesis is supported by (Hussein et al., 2011; Baumgartner & Green, 2011). Therefore, this study makes the following hypothesis:

H16: Result demonstrability has a positive significant impact on intention to use mobile communication system.

### 3. Findings from the Pilot Test

The pilot study in this survey is done with 45 parents and teachers. The questionnaire is translated from English to Arabic to enable the participants to clearly understand the questions in their mother tongue.

Table 1 clarifies the reliability and validity of the model construct. Cronbach alpha and composite reliability are used to test the internal consistency of the construct, while the average variance extracted is used to test the validity. For the internal consistency, Nunnally (1967) recommend a cut-off point of 0.70 and higher for a good internal consistency, and for Konin and Franses (2003) it is recommended to get a cut-off 0.6 and above. For the internal consistency of this study construct, the entire factors construct have a good internal consistency that range from (0.614) to (0.914), this indicates to an accepted internal consistency for the model construct. As for the Relative advantage 0.764, Compatibility 0.699, Complexity 0.914, Result demonstrability 0.786, Trust in the Internet 0.835, Perspective on communication 0.817, Intention to use mobile communication systems 0.897, Self-direction 0.640, Power 0.853, Universalism 0.868, Achievement 0.880, Security 0.840, Stimulation 0.798, Conformity 0.644, Tradition 0.614, Hedonism 0.718, Benevolence 0.897. For the validity test, Shook, Ketchen Jr, Hult, and Kacmar (2004) suggest an average variance extracted higher than 0.5, which confirm a valid model construct. The AVE result of this study construct ranged from (0.551) to (0.767), these values show good and accepted captured variance among the constructs, which is confirmed by the study of Farrell (2010).

Table 1: Construct reliability and validity

No	Factors	Items	Cronbach's Alpha	Reliability	AVE	
1	<b>Perceived characteristics of Mobile communication (PCMC)</b>					
	1	Relative advantage (RA)	6	0.764	0.766	0.616
	2	Compatibility (CP)	4	0.699	0.701	0.551
	3	Complexity (CX)	4	0.914	0.917	0.767
	4	Result demonstrability (RED)	4	0.786	0.788	0.638
2	<b>Trust in the Internet (TI)</b>		3	0.835	0.838	0.688
3	<b>Perspective on communication (POC)</b>		3	0.817	0.819	0.669
4	<b>Intention to use mobile communication systems (IMCS)</b>		4	0.897	0.900	0.750
5	<b>Schwartz's Basic Personal Culture Value (PCV)</b>					
	1	Self-direction (SD)	4	0.640	0.642	0.592
	2	Power (P)	3	0.853	0.856	0.606
	3	Universalism (U)	6	0.868	0.871	0.721
	4	Achievement (A)	4	0.880	0.883	0.733
	5	Security (SE)	5	0.840	0.843	0.693

	6	Stimulation (ST)	3	0.798	0.800	0.650
	7	Conformity (C)	4	0.644	0.646	0.596
	8	Tradition (T)	4	0.614	0.616	0.566
	9	Hedonism (H)	3	0.718	0.720	0.570
	10	Benevolence (B)	4	0.897	0.900	0.750
<b>Total</b>			<b>68</b>			

#### 4. Conclusion

The pilot study above explained the research model and hypotheses development. As used by Abu Nadi (2013), the model used components of UTAUT, PCI and DOI and from Carter and Bélanger's (2005) model and Crane's (2016) recommendation of conciseness and comprehensiveness was followed to develop the model. Thus, the constructs relevant to the research context are relative advantage, compatibility, complexity, result demonstrability, trust in the Internet, trust in government agencies, perspective on communication, and Schwartz's BPV (2006). On the other hand, the constructs (found in PCI) not related to the context were excluded, namely trial ability, image, visibility, and ease of use (which was replaced with its opposite, complexity). Additionally, this chapter outlined the hypothesis development and the postulated significance and direction of influence for each construct on intention to use e-transactions. The overall factors pertaining to the constructs have a good internal consistency that range from (0.614) to (0.914), this indicates an accepted internal consistency of all the constructs in the model

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