

## **Investigating the Determinants of Innovation Adoption in Saudi Arabia**

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*The purpose of this research is to investigate the determinants of innovation adoption in Saudi Arabia. Specifically, the study examines the impact of socio-cultural and religious values on the adoption of technological innovation in this particular country. Although many analyses have been done on innovation and its acceptance in Western countries, little is known about it in the Middle East context. The Middle Eastern countries have unique and traditional socio-cultural and religious customs or norms that are very different from those in the West. This research tries to fill that gap. The study develops a conceptual research model based on existing theories, namely, innovation diffusion theory (IDT), theory of reasoned action (TRA), technology acceptance model (TAM), unified theory of acceptance and use of technology (UTAUT) and Hofstede's cultural dimensions theory (CDT). The proposed conceptual model comprises three categories of drivers: cultural values, social norms and religious values. This study uses qualitative methods to analyze the data. Discussion, conclusion, implications, limitations and future research directions are highlighted in the paper.*

**Key words:** Social values, cultural values, religious values, technology adoption, Saudi Arabia

### **1. Introduction**

Understanding the factors that affect technology acceptance is very important because the most important benefits are associated with access to new and every-changing technologies (Suvarna and Godavari, 2012). Both practitioners and researchers have a strong interest in understanding why people accept information technology in order to develop better methods for designing, evaluating, and predicting how users will respond to new technology (Dillion and Morris, 1996). It is important to understand how people accept and adopt new technologies in the workplace (Louho et al., 2006). Technology should be accepted and used properly because it will be of little (Talukder et al., 2014, Oye et al., 2014, Frambach and Schillewaert, 2002). Technology acceptance can be described as a critical factor in determining the success or failure of any new technology (Samaradiwakara and Gunawardena, 2014). The adoption of a new technological innovation will be successful only if and when people accept and use it effectively in the workplace (Talukder et al., 2014).

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The availability of new technological innovations does not guarantee that employees will use these innovations (Talukder, 2016). The desired benefit from any innovation cannot be realized in organizations if employees themselves have issues in accepting it. This is why it is important to examine the implementation of innovations by workplace personnel (Talukder, 2016). Cultural factors are major issues that determine the acceptance or rejection of new technologies in any society. One of the main factors in rejecting any new technology is its perceived incompatibility with cultural practices, values, and traditions (Hill et al., 1994, Akman and Turhan, 2016). Several studies have emerged during the last three decades to illustrate the relationship between cultural factors and the uptake of technology (Al-Jumeily and Hussain, 2014).

One of the most important and historically long-lasting factors that shape the culture and values of Saudi Arabia's people is Islam. Values are affected by the transmission of religious values and norms. Religious oriented values are expected to have a strong impact on the followers of any given religion (Wahab et al., 2016). Research on the impact of socio-cultural and religious aspects on technology adoption in the Middle Eastern region remains limited although the impact of cultural values in this context has been studied extensively in the developed countries. Little or no research has been conducted on the socio-cultural norms' and religious values' impact on technological innovations Saudi Arabia. In fact, we know relatively little about socio-cultural facets of life influencing technology acceptance by individual employees in Saudi Arabia.

The research findings are expected to contribute to knowledge development by studying this particular phenomenon in Saudi Arabia and to elaborate on the effect of the Saudi cultural and religious factors on the adoption of new technological innovations, which is not found in the previous studies.

The conceptual developed model is based on the existing technology acceptance theories such as the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Rogers' Innovation Diffusion Theory (IDT) and Hofstede's Cultural Dimensions Theory (CDT). Since Saudi society has been so heavily influenced and informed by Islamic tenets and philosophy, the developed model examines the religious values that are expected to affect people's attitudes to the adoption of new technologies. The expected benefits of implementing new technological innovations in Saudi Arabia are also examined in this developed model.

### **1.1 Objectives of the Study**

The specific objectives of this research are to:

1. Investigate the impact of cultural factors on the adoption of technological innovation in Saudi Arabia.
2. Investigate the impact of social factors on the adoption of technological innovation in Saudi Arabia.
3. Investigate the impact of religious factors on the adoption of technological innovation in Saudi Arabia.

## **1.2 Study Rationale and Significance**

It is very important to understand the impact of socio-cultural and religious norms on the acceptance of technological innovations by individual employees in Saudi Arabian organizations. Most of the research on this topic has been done in Western countries, and only very few looked at it in the Middle Eastern context (Alomari, 2014, Al-Saggaf, 2004). Religious values also play an important role in people's lives through shaping their beliefs, knowledge, and attitudes, and this has particular resonance when people encounter a new innovation or invention (Rehman and Shahbaz 2010). This paper attempts to build a conceptual model that examines the effects of socio-cultural norms and religious values in Saudi Arabia on the adoption of technological innovations.

Religious commitments, beliefs and values influence the feelings and attitudes of people to any innovation (Rehman and Shahbaz 2010). Religious oriented values are expected to have a strong impact on the followers of a given faith (Wahab et al., 2016). The socio-cultural norms in Middle Eastern societies are very different from those in Western countries (Kirlidog, 1996). While Saudi Arabian cultural values originate in the teachings of Islam, these values have not been emphasized in the extant literature (Wahab et al., 2016) with reference to the acceptance of technology. Very few studies have explained the effect of religious views on use of information technology in Middle Eastern region (Alomari, 2014, Al-Saggaf, 2004).

## **1.3 Theoretical Contribution of the Study**

The study makes several theoretical contributions as follows:

### **1.4 Development of a Comprehensive Model**

This study develops a theoretical construct that integrates socio-cultural and religious values and individual innovation adoption issues into a coherent model. The combination of socio-cultural and religious variables in this study goes beyond previous research in an attempt to bring together all the relevant factors that may affect individual employees' innovation adoption into one coherent model. The study combines multiple sets of variables found in socio-cultural and religious as well as innovation adoption-related studies, into a single study context. Cultural values, social dimensions and religious norms influence individual attitudes and perceptions which consequently lead to adoption behaviors.

### **1.5 Filling the Knowledge Gap**

Very few studies have been done on the Middle East region concerning the effect of socio-cultural and religious values on employees' acceptance of technological innovations. Most previous research on the influence of cultural norms has been conducted in Western countries (Maguire et al., 2010, Abdelghaffar, 2012, Hossain et al., 2011, Alhirz and Sajeev, 2015). This research fills that knowledge gap by especially focussing on a variety of cultural factors, social influences and religious values on the adoption of new technologies in workplace settings.

## **1.6 Better and Deeper Understanding of the Socio-Cultural and Religious Values Impacting on the Level of Technology Adoption**

This research will provide a better and deeper understanding of the impact of socio-cultural and religious values on technology adoption by employees working for organizations in Saudi Arabia. The study is expected to provide greater understanding of how cultural, social and religious values affect employees' technological innovation adoption behaviour. Middle East countries are a perfect example where cultural values, social influence and religious values prevail in all aspects of an individuals' life. On this theme, the study emphasizes the impact of national cultural dimensions that shape individuals' social characteristics and acceptance of technological innovations in Saudi Arabia.

The findings of this research are expected to be especially relevant to other Middle East countries that share cultural characteristics with Saudi Arabia. The results are expected to provide a theoretical explanation for the acceptance of technological innovations in Arab countries given that they share a similar language, religion, culture and traditions.

## **2. Literature Review and Theoretical Framework**

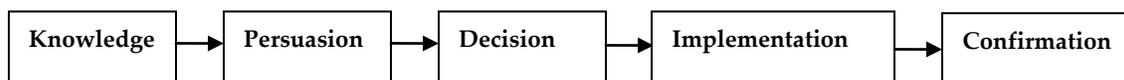
### **2.1 Technological Innovations**

Innovation has been defined in various ways. Zaltman et al. (1973) argued that innovation is any system or program that is new to individuals or organizations regardless of the age of this innovation or the number of its users. This means that the innovation may be new only to those individuals or institutions who are embracing it. Innovation according to Afuah (2003) is defined as the use of technological systems that are new to employees. This system offers a better and improved service and the outcome of the new system is more efficient. In the same way, Rogers (2003) argued that innovation is any idea, practice or object that is looked at as new by an individual. Talukder et al. (2014) defined innovation as something that adds value to an organization. According to his definition it will only be considered an innovation when it can be implemented; it cannot be considered an innovation if it is not incorporated into an organization's daily activities. According to the Australia Innovation System Report (Department of Industry, 2016), innovation is a key driver of business competitiveness, economic growth, and improved living standards. The report indicated that the term innovation could carry different meanings depending on the background and experience of the person who is seeking it. Innovation has been defined in the above-mentioned report as implementation of a new or significantly improved product, process, new marketing method or new organizational method in business practices, workplace organization or external relations. This report also indicated that the participation of a range of actors across the spectrum of business, government, academia and other parts of the community is essential for a well-functioning innovation system (Department of Industry, 2016).

## 2.2 Innovation Adoption Process

The adoption of any new technology usually starts with the recognition that there is a need for solutions. This is followed by the initial decision to attempt the adoption process and then implement the solution (Wisdom et al., 2014). The adoption process at an organizational or system level is complex because it involves promoting change in routine practices when decision-makers do not perceive changes as necessary or want them (Wisdom et al., 2014). (Rogers, 2003) in his model for Innovation Diffusion Theory (IDT) indicated that every innovation passes through five stages before it is implemented: knowledge, persuasion, decision, implementation, and confirmation (The Interaction Design Foundation, 2016).

**Figure 1: Rogers' Model of the Innovation Adoption Process**



Source: Rogers (2003)

Rogers (1962) identified five traits that help us to categorize people according to their adoption of an innovation. These five traits are:

1. Innovators: people who are the first to adopt innovation and willing to take the risk (2.5%).
2. Early adopters: the second category to adopt an innovation (13.5%).
3. Early majority adopters: this category adopts the innovation some time after the first two categories (34%).
4. Late majority adopters: this category adopts an innovation after the average member of the society (34%).
5. Laggards: this category is the last to adopt an innovation (16%).

## 2.3 Understanding the factors that affect the adoption

The availability of these technologies does not guarantee their use by staff (Talukder et al., 2014, Bhattacharjee, 1998). In the 21<sup>st</sup> century, technological innovations are advancing at an incredible pace, but the use of these technological innovations is far below expectations (Venkatesh et al., 2000, Talukder et al., 2014). The adoption of a new technological innovation cannot be successful unless people accept it and use it effectively in the workplace (Talukder et al., 2014). It is indicated by (Rehman and Shahbaz 2010) that motivating users to use innovation remains a major problem for businesses and other organizations. On this theme, an individual's innovation acceptance and the drivers of this adoption remain largely unknown, although innovation adoption has been studied extensively (Frambach and Schillewaert, 2002). Furthermore, very little is known about the ways in which individuals embrace an innovation and the factors that influence doing so (Bhattacharjee, 1998, Frambach and Schillewaert, 2002, van Everdingen and Wierenga, 2002, Venkatesh et al., 2000).

Understanding the acceptance process and factors that make this process effective is essential for organizations if this adoption is to be successful (Lee et al., 2013, Talukder et al., 2014). Studies have identified the factors that are involved in the individual's intention, decision, and satisfaction to use a new or innovative technology (Silva and Dias, 2007). Since these organizations' personnel often come from very diverse cultural or social backgrounds, it is important to understand their behavioral differences in accepting technology innovations (Zhang and Ma, 2009).

## **2.4 Impact of Culture on Technology Acceptance**

According to Jaafreh (2018) national culture is an important issue in technology acceptance. Culture has a significant effect on the diffusion of technology (Ameen and Willis, 2015, Loch et al., 2003, Straub et al., 2001). A significant role is played by cultural background in affecting the uptake and use of new technology (Hofstede, 1980, Trompenaars, 1993, Tse et al., 2004, Barton, 2010). Culture was acknowledged in previous studies as wielding a significant impact on technology adoption, specifically in developing countries such as those with Arab histories (Ameen and Willis, 2015). The incompatibility of any technology with societal cultural practices, values, and traditions is considered one of the main factors in rejecting this technology (Akman and Turhan, 2016, Hill et al., 1994) Literature on technology acceptance and adoption revealed that culture is an important key determinant in the acceptance of technology (Abu Nadi, 2012, Leidner and Kayworth, 2006). A significant correlation between the adoption of ICT and cultural factors has been noted in many studies (Erumban and De Jong, 2006, Min et al., 2009, Srite and Karahanna, 2006, Abu Nadi, 2012, Twati, 2008, Zhang and Maruping, 2008). These researchers indicated that Arab culture can both hinder and support the acceptance of technological innovations. Abu Nadi (2012) stated that a lack of acceptance of new technology occurs because individuals carry cultural biases, beliefs, and values which affect their perceptions of what the new technology may portend.

The result of Al-Ghaith (2015) study about the social network behavior in Saudi Arabia suggests that attitude and subjective norms have a significant effect on the participation intention of adopters. It is for this reason that during the late 1960s/early 1970s, Hofstede was one of the first scholars to explore the influence of cultural differences on the adoption and diffusion of ICT-based innovations (Olushola and Abiola, 2017). Since then, many studies have incorporated Hofstede's cultural dimensions to explain how it impacts on technology adoption (Al-Hujran et al., 2011, Frigui et al., 2013, Twati, 2008, Kahttab et al., 2012). It should be noted that El Louadi and Everard (2004) stated there are some limitations in Hofstede's dimensions with reference to Arab culture. In fact, previous studies (Loch et al., 2003) found that Arab culture does display certain traits when studying technology transfer given that certain problems can arise: cronyism; disposition against planning; preference for face-to-face communications; and perceptions of religious prohibition or one's religion being undermined.

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Barton, 2010, Trompenaars and Hampden-Turner, 1997). Culture was acknowledged in previous studies to have a significant impact on technology adoption, specifically in developing countries such as those with an Arab history (Ameen and Willis, 2015). The incompatibility of any technology with the society cultural practices, values, and traditions is considered one of the main factors in rejecting this technology (Hill et al., 1994, Akman and Turhan, 2016). Literature on technology acceptance and adoption revealed that culture is an important key determinant in the acceptance of technology (Leidner and Kayworth, 2006, Abu Nadi, 2012). A significant correlation between the adoption of ICT and cultural factors has been found in many studies (Erumban and De Jong, 2006, Twati, 2008, Zhang and Maruping, 2008, Min et al., 2009, Srite and Karahanna, 2006, Abu Nadi, 2012).

## **2.5 Impact of Religion**

Since almost 75% of the world's population belong to some kind of religion or faith, religion as a source of values is generally accepted (Wahab et al., 2016, Zuckerman, 2007). One of the main factors in rejecting new technologies is its incompatibility with the society cultural traditions, practices, and values (Hill et al., 1994, Akman and Turhan, 2016). Culture was acknowledged in previous studies to have a significant impact on technology adoption, specifically in developing countries such as the Arab countries in which Islam is the main pillar of culture (Ameen and Willis, 2015).

Islam according to Abu Nadi (2012) is the overarching basis of Saudi Arabia's culture and sets the moral principles and behaviors in its society. Increasingly, employees' religious beliefs are being analyzed by researchers within the field of management as a significant part of management research (Al-sharif, 2014). Understanding the significance of the impact of Islamic principles and values on organizations cannot be underestimated (Al-sharif, 2014). Although values have been the subject of extensive research internationally, work on Islamic values remains relatively unexplored in the literature (Wahab et al., 2016).

Most of the research within the management field seems to neglect religion as a factor that influences management (Sedikides, 2010, Al-sharif, 2014). The reason for this neglect of religion as an influential factor in research is that most researchers – who are in fact Western - assume that organizations have a neutral view on religious beliefs and employees leave those beliefs at home before going to work. However, this assumption simply does not apply to how things are done in Middle Eastern countries (Mellahi and Budhwar, 2010, Al-sharif, 2014).

## **2.6 Impact of Social Factors**

Social factors were found to be more significant than economic factors in driving individuals within organizations to adopt innovations (van Everdingen and Wierenga, 2002, Westphal et al., 1997, Talukder et al., 2014). Employees may adopt an innovation not because of perceived social pressure but because of its usefulness (Talukder et al., 2014). A social network is considered to be one of the factors that can affect individuals' attitude to adopt any technological innovation. People share information with other

organizations and is more likely to lead organizational members to be exposed to new ideas and concepts (Frambach and Schillewaert, 2002, Talukder et al., 2014, Brown and Venkatesh, 2005, Katz and Shapiro, 1994, Kraut et al., 1998, Rogers, 2003). Also, employees are influenced by their peers in the adoption of an innovation (Talukder et al., 2014). They normally imitate this by looking at what their peers do (Frambach and Schillewaert, 2002, Talukder et al., 2014). If their peers adopt an innovation, this may signal its importance and certain advantages and thus eventually motivate other employees to do the same. In their study, Brancheau and Wetherbe (1990) found that employees' decision to adopt an innovation yields a significant impact on both management and peers.

**Table 1: Findings of Some Studies on Technology Acceptance**

No.	Author	Date	Paper	Findings
1	Mangula, I., & Brinkkemper, S.	2017	A Meta-analysis of ICT Innovation Adoption Factors: The Moderating Effect of Product and Process Innovations	Five factors consistently affect the adoption decision for both product and process innovations, namely relative advantage, compatibility, top/senior management support, organizational readiness, and competition. Two factors, namely organizational size and external pressure, highlighted the significant effect for product innovations, but not for process innovations..
2	Aldraehim, M.	2013	Cultural impact on e-service use in Saudi Arabia	This study identified four Saudi Arabian cultural values impacted by the use of e-services in the public and private sector in Saudi Arabia. Of these four, nepotism and the fear of a lack of interaction with other humans were found to discourage intentions to use e-services. In contrast, employee commitment did have a positive effect. The fourth Saudi Arabian cultural value was assumed initially to have positive effects but the finding was the opposite.
3	Talukder, M.	2012	Factors affecting the adoption of technological innovation by individual employees: An Australian study	Perceived usefulness and managerial support are the two dominant variables in explaining adoption. Individual adoption of innovation is influenced by two social factors (peers and social network). Individual adoption of innovation is also influenced by demographic factors.
4	Abu Nadi, I.	2012	Influence of Culture on e-Government Acceptance in Saudi Arabia	The most interesting and unexpected finding is the positive influence of conservative values. Saudi society is religiously conservative, but these attributes have not impeded the acceptance of technology.
5	Ezzi, Shaza, Teal, E. & Izzo, G	2014	The influence of Islamic values on connected generation students in Saudi Arabia	Saudi Arabian college/university students see themselves as members of a connected generation. They responded favorably toward the use of on-line video. They have greater preference for video searching and sharing for social communication and entertainment; there is less interest in major news information shown by them. 50% of respondents were offended by videos portraying non-Islamic behavior, but this had only a moderate effect on males.
6	Zhao, F., Shen, K., & Shen, A.	2014	Effects of national culture on e-government diffusion A global study of 55 countries	Culture does have an effect on e-government diffusion in various ways. Economic development in the form of GNI per capita has a moderating effect on the relationship between culture and e-government diffusion

## 2.7 Cultural Norms in Saudi Arabia

Islam plays a significant role in Saudi culture by defining the social manners, traditions, obligations, and practices enacted throughout that society. The second source that forms the culture in Saudi Arabia is the Arab legacy. Arab culture, which is responsible for setting the agenda by which people live their lives, is considered a strong predictor for the resistance to ICT (Straub et al., 2001). Arab culture, according to them, stresses the importance of home, family and kin relationships, and in fact the traditional nature of people's lives and how they do things are antithetical to new technologies and their attendant presumptions.

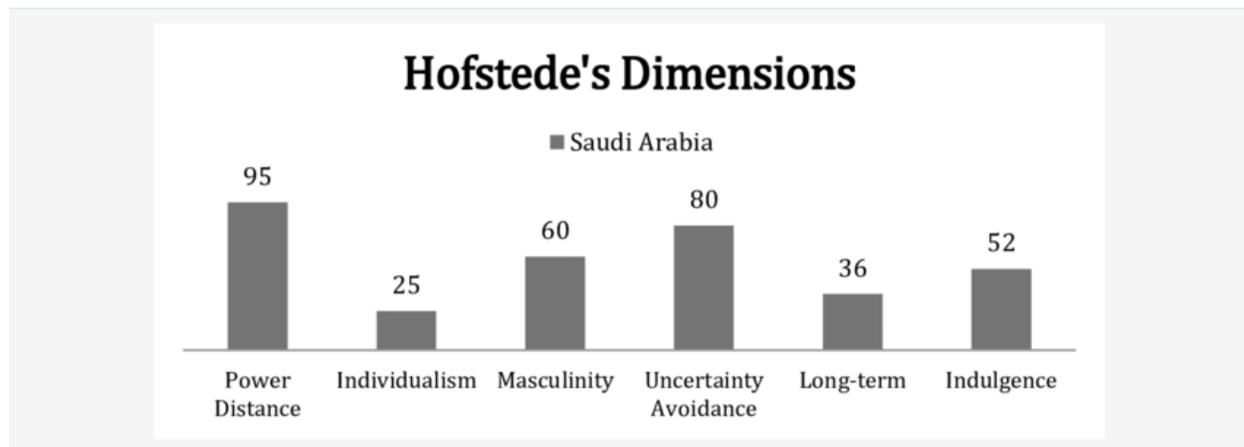
Culture in Saudi Arabia is characterized by its infusion of Islamic values and symbolic emphasis on Bedouin culture (Long, 2005). Islam according to (Abu Nadi, 2012) is the basis of Saudi Arabian culture and sets the moral principles and behaviors in its society through the *Koran* (the holy book) and the *Sunna* (the sayings and practices of the prophet Mohammed peace be upon him). The main characteristics of Saudi societal-cultural values are: adhering to tribalism, acknowledging hierarchy or a higher authority, seeking prestige, and maintaining conservative practices in one's life (Abu Nadi, 2012, Alkahtani et al., 2013). Saudi culture has been historically, strongly influenced by Bedouin culture in its strong emphasis on kinship solidarity and through the concept of extended families. The clans organize themselves around their male relatives (Long, 2005).

## 2.8 Hofstede's Cultural Dimensions

The effect of cultural values on technology adoption and/or acceptance has been widely studied and Hofstede's cultural dimensions theory has had much influence (Twati, 2008, Al-Hujran et al., 2011, Kahttab et al., 2012, Frigui et al., 2013). Hofstede examined how culture works in many countries and he conducted comprehensive studies on how values are influenced by culture. According to him, "culture" is a form of mind programming that distinguishes the members of one human group from another (Hofstede, 1980). Hofstede published his cultural dimensions model at the end of the 1970s, based on a decade of comprehensive research.

His model of national culture consists of six dimensions (described in more detail below). He conducted comprehensive studies of how culture influences values in the workplace. Between 1967 and 1973 a large database was developed, consisting of IBM employees' value scores, in 70 countries where the company operated. Initially, he identified four dimensions that could distinguish one culture from another: power distance; uncertainty avoidance; individualism vs. collectivism; and masculinity vs. femininity. In his 1993 study, Hofstede added a fifth dimension referred to as "long term orientation" (Cavusgil et al., 2008). In 2008, Hofstede and others added a sixth cultural dimension, known as indulgence versus restraint (Hofstede et al., 2008).

**Figure 2: Hofstede's dimensions for Saudi Arabia**



Source: Hofstede (2015)

### 2.8.1 Power Distance Index (High versus Low)

Power distance refers to the extent to which unequal power distributions are expected and accepted by less powerful members of organizations and institutions. In a large power distance society, parents teach children obedience, while in a small power distance society parents treat children as equals. Power distance deals with the amount of distance (or power) between people at the top and people at the bottom of society. In other words, people at the bottom expect these inequalities even though they may not necessarily agree with them. Saudi Arabia scores high on this dimension (score of 95). This means substantial inequalities exist in society and people are accepting this hierarchical order where everyone has a place in society which needs no further justification (Hofstede Insights, nd).

### 2.8.2 Individualism versus Collectivism

The individualism-collectivism dimension relates to individual and societal characteristics, specifically the extent to which people in a society are integrated into groups or prefer to be as individualist as possible. In an individualist society, individuals are expected to stand up for themselves, assert their own personality and drives, look after one's own family and their own affiliations. In contrast, in collectivist societies, individuals behave as members of a community, group or organization so that harmony is promoted. Saudi Arabia's individualism ranking of 25 indicates it is a collectivist society, which manifests in a close long-term commitment to being a member of the 'group', i.e. family, extended family, or a network of extended relationships (Al-Jumeily and Hussain, 2014).

### 2.8.3 Masculinity versus Femininity

The masculinity dimension refers to how a society adheres to the traditional values of male and female roles – with the man likely to be the provider and the woman the

caregiver. A society is seen as feminine when there is not a strong differentiation between the genders for emotional and social roles—both men and women should be modest and caring and both boys and girls may cry, but neither should fight. In masculine societies, both men and women are assertive and competitive, however, women are less so than men. Saudi Arabia has a score of 60 which indicates a high level of masculinity and individuals are expected exert much effort to be successful.

#### **2.8.4 Uncertainty Avoidance Index (High versus Low)**

Uncertainty avoidance refers to the ways in which a culture deals with not being able to predict the future. Cultures high in uncertainty avoidance dismiss unstructured situations with strict behavior codes, laws and rules, disapproval of deviant opinions, and a belief in an absolute Truth (Hofstede, 2011). Saudi Arabia's uncertainty avoidance ranking of 80 indicates its society prefers avoiding uncertainty and is characterized by low level of tolerance for uncertainty.

#### **2.8.5 Long-term Orientation**

A long-term orientation fosters virtue directed toward the future, in particular, perseverance and thrift and ordering relationships according to perceived status. A short-term orientation fosters virtue that are related to the past and present, respects traditions, preserves 'face', where there is an emphasis on personal steadiness and stability. Long-term orientation refers to the degree the society embraces, or does not embrace, long-term devotion to traditional, forward-thinking values. A high long-term orientation ranking indicates the country ascribes to the values of long-term commitments and respect for tradition (Cassell and Blake, 2012). It is very evident that Saudi Arabian society reflects this dimension given its low score of 36. People have a strong concern with establishing the absolute truth, exhibit great respect for traditions, and focus on achieving quick results (Hofstede, 2011).

#### **2.8.6 Indulgence versus Restraint**

This dimension identifies the extent to which a society allows gratification of basic and natural human desires that are related to enjoying life and having fun (Hofstede, 2011). According to (Hofstede Insights, nd), Saudi Arabia's intermediate score of 52 does not point to a clear preference on this dimension. Culture in Arab countries is complex but generally it can be summarized as a combination of people's self-perceptions, values and attitudes which help us understand how Arab individuals and organizations in these countries function in different circumstances, given that they are all Islamic. Seven Arab countries were included in Hofstede (1980): Egypt, Iraq, Lebanon, Saudi Arabia, Kuwait, Libya, and the UAE (Najm, 2015). The characteristics of these Arab countries, according to this study are: long power distance/high hierarchy, collectiveness, masculinity, relationship orientation, high avoidance of uncertainty, humane orientation, tribal and family receptiveness, gender discrimination, and past orientation (Najm, 2015).

**Table 2: Saudi Arabia compared to Kuwait and the UAE  
(based on Hofstede’s Cultural Dimensions)**

	<b>Saudi Arabia</b>	<b>Kuwait</b>	<b>UAE</b>
Power Distance	95	90	90
Individualism	25	25	25
Masculinity	60	40	50
Uncertainty Avoidance	80	80	80
Long-term Orientation	36	N/A	N/A
Indulgence	52	N/A	N/A

What can be observed from this table are the similarities between Saudi Arabia and the GCC countries in terms of their cultural dimensions.

**Table 3: Saudi Arabia Compared to Three Western Countries**

	<b>KSA</b>	<b>USA</b>	<b>UK</b>	<b>Australia</b>
Power Distance	95	40	35	36
Individualism	25	91	89	90
Masculinity	60	62	66	61
Uncertainty Avoidance	80	46	35	51
Long-term Orientation	35	26	51	21
Indulgence	52	68	69	71

Observed in the table above are the differences between Saudi Arabia and three Western countries concerning their cultural dimensions. At the same time there do appear to be some similarities between them. According to Hofstede’s research, Saudi Arabian culture scored high in terms of power distance, uncertainty avoidance, and masculinity [28] but low on individualism [29]. Conversely, the Western countries scored high for Individualism and low in Power Distance, Uncertainty Avoidance and Masculinity [28]. It is therefore sensible to conclude that Saudi Arabian culture is still very different to Western culture, despite the inroads made by technological innovations in the country (Khashman and Large, 2011).

### 3. Theory and Research Model

The model of this research has been developed based on five theoretical models: the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003); the Innovation Diffusion Theory Model (IDT) by Rogers (2003); the Theory of Reasoned Action (TRA) by Ajzen and Fishbein (1980); the Technology Acceptance Model (TAM) by Davis (1989); and finally, the Cultural Dimensions Theory (CDT) by Hofstede (1973). Modifications have been done to include other factors relating to Saudi society’s culture.

The basis of the Theory of Reasoned Action (TRA) conceptual model is the distinction between beliefs, attitudes, intentions and behaviors (Al-Gahtani and King, 1999,

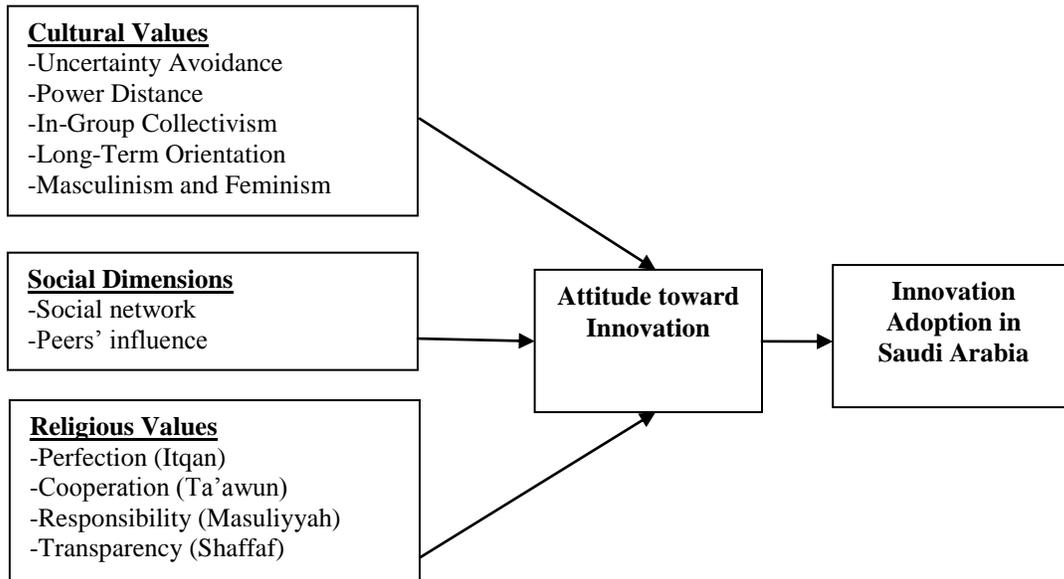
Talukder, 2016). Performance of a specific behavior by any individual according to the TRA model is determined by his/her behavioral intentions to enact that behavior, while a behavioral intention is jointly determined by the person's attitude and subjective norms concerning the behavior (Talukder, 2016, Al-Gahtani and King, 1999). The societal culture of Saudi Arabia is completely different from those of Western countries. Saudi culture is a homogeneous one influenced deeply and historically by Islam and the tribal system (Alkahtani et al., 2013). This explains the need to develop a customized model to account for these different social factors.

The customized developed model consists of three categories. The first category is the international cultural values used in the original model known as Cultural Dimensions Theory (CDT) devised by Hofstede 1973. The international cultural values used in the developed model are: uncertainty avoidance, power distance, in-group collectivism, long-term orientation, and masculinity-femininity. Some other local cultural values that distinguish Saudi society from others have been added to these international cultural values. The second category is the social dimensions used in the Theory of Reasoned Action (TRA), developed Ajzen and Fishbein (1980). The basis of the TRA conceptual framework (Al-Gahtani and King, 1999), is the distinction between beliefs, attitude, intentions and behaviors. These social dimensions comprise social networks and peers' influence.

The third category constitutes religious values that differentiate Saudi society from Western societies. This category is similar to that of social influence in the UTAUT Venkatesh et al. (2003) and the normative beliefs in the TRA by Ajzen and Fishbein (1980). The latter authors state that people may form different beliefs about the consequences of performing a behavior and different normative beliefs on the basis of varied experiences. These beliefs in turn determine attitudes and subjective norms, which then determine intention and the corresponding behavior. These religious values, that are expected to influence employees' attitudes towards adoption of new technologies, include perfection, cooperation, responsibility, and transparency.

The notion of attitude is also included in this proposed model as a factor; it is affected by the international cultural values, social dimensions, and religious values and consequently affects the adoption of these innovation technologies. Figure 3 illustrates the conceptual research model.

Figure 3: Conceptual Research Model



#### 4. Method

The study uses qualitative techniques to analyze the data. In particular, the study uses published information from in journal articles, published books, monographs, conference papers and online resources related to the study topic. The method used is the desk-top method of data collection, summarization, synthesis and dissemination of published information concerning the technology acceptance models. The analysis is based on a literature review of the topic. The study develops a conceptual research model based on existing theories, namely, innovation diffusion theory (IDT), theory of reasoned action (TRA), technology acceptance model (TAM), unified theory of acceptance and use of technology (UTAUT) and Hofstede's cultural dimensions theory (CDT). The proposed conceptual model comprises three categories of drivers: cultural values, social norms and religious values. The development of this conceptual model is considered as an improvement report over the models in the previous studies. The qualitative method was used to analyze and interpret the data, the findings and draw conclusions.

#### 5. Discussion

The results of the study found that cultural values play a significant role in adoption of technological innovation. This confirms other researchers such as Hosftede (1980), Trompenaars and Hampden-Turner (1997), Tse et al. (2004) and Barton (2010), who contended that a significant role is played by cultural background in affecting the uptake and use of new technology. Culture was acknowledged in previous studies as exerting a significant impact on technology adoption, specifically in developing countries such as those with Arab histories (Ameen and Willis, 2015). The incompatibility of any technology with a society's historical, religious, cultural traditions, practices, and values

is considered one of the main factors in rejecting this technology (Hill et al., 1994, Akman and Turhan, 2016). According to Jaafreh (2018) national culture is an important issue when it comes to technology acceptance. Culture has a significant effect on the diffusion of technology (Ameen and Willis, 2015, Loch et al., 2003, Straub et al., 2001).

The study also found that the social factor is an important factor that affects the adoption of technological innovations in Saudi Arabia. This result is supported by the studies of Peansupap and Walker (2005), Westphal et al. (1997), and Talukder et al. (2014) who stated that Social factors were found to be more significant than economic factors in driving individuals within organizations to adopt innovations. Employees may adopt an innovation because of perceived social pressure and not because of its usefulness (Talukder, 2012). Individuals are more likely to do an act if they perceive the existence of greater social pressure from salient referents to perform that act (Lam et al., 2007).

Since Islam plays a significant role in Saudi culture by defining the social manners, traditions, obligations, and practices enacted in the society, it is very important to study the effect of Islamic values on the acceptance of new technologies.

The study found that religious values constitute an important factor affecting the level of technology adoption in Saudi Arabia. Researchers who investigate management beliefs and practices have begun evaluating employees' religious beliefs as a significant aspect of management practices (Al-sharif, 2014). The significance of understanding the impact of Islamic principles and values on organizations cannot be underestimated (Al-sharif, 2014). In the teachings of Islam, a Muslim should practice good deeds to obtain the blessings and mercy from God, help other creatures of this Earth, be responsible for the wellbeing of society and do no harm to others (Shafique et al., 2015).

Islamic values have important implications for managers and leaders in Arab countries (Ali and Weir, 2005, Abuznaid, 2006, Branine and Pollard, 2010, Hammoudeh, 2012, Mashlah, 2017). Al-sharif (2014) stated that the significance of understanding the impact of Islamic principles and values on organizations cannot be underestimated. Al-Omar (1994) and Ibn Baz et al. (2005) stated that for organizations to function well in the Muslim world, the main inspiration must be derived from Islamic teaching and values. The guiding principles for good moral and social conduct are applicable to management and business (Al-Abdouli, 2004). The example for the positive effect of Islamic values on the efficiency of organizations is the success of many companies in Malaysia by imposing these Islamic principle (Friedman, 1999, Lipford et al., 1993, Yarwood, 1993). Those who are committed to Islamic beliefs tend to refuse any unethical conduct in their organization (McNichols and Zimmerer, 1985). Saudi society's culture is mostly influenced by Islam in determining its traditions, social norms, patterns, obligations, privileges and practices (Al-Saggaf, 2004).

## **6. Conclusion and Implications**

The great advances being made in ICT are affecting every aspect of our lives and furthermore, this ICT revolution has played an important role in the economic and social

development throughout most of the world (Halili et al., 2017). Success in the current business world is attributed to the effective use of modern technology (Dumpit and Fernandez, 2017). The adoption of a new technological innovation can be successful only when people accept it and effectively use it in the workplace (Talukder et al., 2014). To better appreciate the factors that influence the use of ICTs in developing countries, it is important to understand the theoretical models used to explain ICT adoption in these countries (Taylor, 2015). This study is an attempt to develop a model, based on the well-known theories of technology adoption, in order to examine the effect of some socio-cultural and religious factors on the acceptance and adoption of technological innovations in Saudi Arabia.

The most important findings of this study are that cultural factors, social factors, and religious factors are found to have an effect on the adoption of technological innovations in Saudi Arabia. These results are supported by most of the previous studies in the literature.

This research contributes to knowledge development by studying a particular phenomenon in Saudi Arabia. The new conceptual model will encourage greater learning technology adoption and facilitate a better understanding of the factors affecting individuals' acceptance of innovation in the Middle East context. Theoretically, such research will enrich the technology acceptance literature by addressing a construct, which combines adoption issues into a coherent model. Thirdly, this research will assist managers to identify and benchmark strategies so that technology adoption occurs in their organizations. The results of this study identify several determinants of the adoption of technological innovation in Saudi Arabia. Because this study examines the Saudi perspective, the most important issue is the impact of cultural and religious values on the adoption of technological innovation. The findings of this study contribute to this gap in the knowledge. Additionally, this study benefits public sector and private sector organizations in Saudi Arabia and helps organization managers to introduce new technological innovations. The model developed in this study could also serve to generate a number of hypotheses for further empirical testing using a larger sample and quantitative research methods.

## **7. Limitations and Further Research**

There are some limitations and shortcomings in this study that need to be considered. This study is limited to Saudi employees in the Ministry of Foreign Affairs (MOFA). It does not include employees from other Arab nationalities even though the cultures of most Arab countries are similar. Furthermore, the study does not include Saudi employees from different public or private sector institutions. This study raises a number of opportunities for future research, both in terms of theory development and concept validation. More research will be necessary to refine and elaborate the effect of social and religious factors on the adoption of technological innovations in Saudi Arabia and other Arab and Muslim countries. The model tried to examine four Islamic values which are: perfection, cooperation, responsibility, and transparency. Further studies could be done to examine other Islamic values.

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