Impact of Users' Socio-Cultural and Religious Orientation on Government Resource Planning (GRP) Systems Usage in Saudi Arabia

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ABSTRACT This study investigates the impact of users' socio-cultural orientation and religious values on government resource planning systems in the Kingdom of Saudi Arabia. Although many studies have been conducted on the adoption of technology in developed nations, only a few analyses have focused on the Middle Eastern region. This research fills that gap. The study developed an integrated conceptual research model based on existing technology acceptance theories, namely theory of reasoned action, technology acceptance model, unified theory of acceptance and use of technology and Hofstede's cultural dimensions theory. An online survey questionnaire was sent to 1677 employees at the Ministry of Foreign Affairs in Saudi Arabia and a total of 377 completed questionnaires were received of which 340 were considered usable, making a response rate of 22.48%. Data was analyzed using multivariate statistical analysis. The analysis finds there is a relationship between the socio-cultural and religious constructs with reference to attitude about using government resource planning systems. Results reveal that 55% of the variance ($R^2 = 0.557$) of employees' attitude to the GRP application can be explained by the effect of socio-cultural and religious variables. Findings show that cultural values (t (340) =3.862, p<0.000), social network (t (340) =4.095, p<0.000), peers' influence (t (340) =4.515, p<0.000) and religious values (t (340) =5.062, p<0.000) are significant predictors of GRP acceptance. Furthermore, the analysis shows demographic factors moderate between the determinants and users' perceptions. These findings have important implications for the acceptance and implementation of GRP systems in Saudi Arabia.

INDEX TERMS Government resource planning (GRP) systems, cultural values, social networks, peers' influence, religious values, perception, usage level, Saudi Arabia.

I. INTRODUCTION

Every nation throughout the world is striving to obtain and implement the latest technology in order to improve its economy, how business is done, and people's lives, as stated by Oye *et al.* [1] and Samaradiwakara and Gunawardena [2]. The proliferation and extensive use of ICTs is changing the way people and organizations work [3], [4]. Success in business is attributed to the effective use of modern technology [5] and the ability to keep up with changes in software developments. The tremendous advances made in ICT are

affecting every aspect of our lives and furthermore, this ICT revolution has played an important role in economic and social developments throughout the world [6]. Not only are these technical advances changing lives in the developed and developing nations, the digital/online revolution constitutes a techno-economic paradigm shift having profound implications.

The availability of new technological innovations does not guarantee that employees will use them [7]. The desired benefit from any innovation cannot be realized in businesses and other organizations if it is not accepted by the workforce. This is why it is important to examine the adoption of innovations by employees [7]. The introduction of innovation requires

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changing employees' behaviors and attitudes towards such changes in a positive way [7], [8]. Users' acceptance of technology has been viewed as an important factor in determining the success or failure of any information system-related project [9].

The most important benefits are associated with access to new technologies. This is why understanding technology acceptance is vital [10]. 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 emerging market economies [4]. It is critically important to understand how people accept and adopt new technologies in the workplace [11]. Technology has to be embraced and used appropriately otherwise it will be of little use [1], [12], [13]. Technology acceptance can be described as a critical factor in determining the success or failure of any new technology [2]. The adoption of a new technological innovation will be successful only when people accept it and effectively use it in the workplace [12]. The shift to digital technologies is so pronounced in recent decades that lack of acceptance would almost certainly guarantee the loss of competitive advantage [14] or the ability to stay in business in any meaningful way.

The Enterprise Resource Planning (ERP) system has become one of the most important fields under the information systems umbrella. The ERP system is an integrated software package that includes all business functions required to perform relevant procedures. In order to act on rapidly changing business environments, technological enhancements and rising pressure of competition, organizations are forced to adapt their systems and perform ERP system implementation [15]. ERP system implementation requires huge investments for the organization, and it is not only a major financial decision, but an effective solution that can affect all parts of business such as accounting, marketing, manufacturing, human resources and other operations [16]. ERP implementation is a new phenomenon with huge potential in Middle Eastern organizations and particularly in Saudi Arabia [17], [18].

The ERP system in Saudi government organizations is referred to as the Government Resource Planning (GRP) system. Technology in the country's government departments is still in its infancy and senior managers have not yet implemented new technologies. This is what motivates the government to implement the ERP in its bureaucracies [18]. This study investigates the socio-cultural and religious factors concerning the acceptance and adoption of the GRP as a new technological innovation in Saudi Arabia.

The main reason for selecting this system is that there is a lack of ERP acceptance and adoption studies in the Middle East countries generally [19]–[22]. Studies show that there is a need to investigate social and cultural factors affecting the behavioral acceptance and adoption of ERP users in developing countries [22]–[25]. Despite the popularity of ERP, the failure rate of ERP implementation remains high [26]. It is said that about 70% of ERP implementations fail to

deliver anticipated benefits [27]. This is why it is very important to study critical success factors because they provide clear guidance to practitioners on where to focus and allocate resources reasonably in planning and implementation stages [28]. According to Saleh *et al.* [29] factors and challenges of implementing ERP in developing countries differ from those in Western countries. The majority of these studies have been conducted in Western economies and very few of them have examined the implementation in Middle Eastern countries and none at all in Saudi Arabia [29].

Researchers have investigated factors that determine the adoption of technological innovation using theories including the technology acceptance model (TAM) [30], diffusion of innovation theory (DIT) [31] and unified theory of acceptance and use of technology (UTAUT) [32] Collis [33] argued that culture is an important factor that influences how humans accept, use, and react to the technology. Literature on technology acceptance and adoption has shown that culture is a key determinant [14], [34]. Scholars have found there is a significant correlation between cultural factors and the adoption of ICT [14], [35], [36].

The culture of any society has a huge impact on technology. It is considered one of the main factors that will determine whether individuals in that society or workplace [37], [38] will adopt the technological innovation. As stated previously, the use of information technology varies from culture to culture [39]–[41]. Previous studies investigated the effect of cultural values on technology adoption by incorporating Hofstede's dimensions to account for culture [42]–[45]. For this reason, it is important to study the impact of socio-cultural values on the acceptance and adoption of new technologies.

Demographic characteristics are considered to be moderating variables that affect individuals' beliefs and attitudes about the adoption of technological innovations. Demographics have been noted by Frambach and Schillewaert [13], and Fishbein and Ajzen [46] as influential factors that affect people's behavior. Demographic characteristics such as age, gender, education qualification, and ethnicity have been regarded by Hernández *et al.* [47] as important when understanding technology adoption behavior as well as the behavior of technology users.

In their analysis, Dimitrios and Alali [48] describe how particular demographic characteristics and social environment affect people's involvement with social media. The factors examined were gender, age, education, employment status, income, profession and Internet usage. In their survey, 596 individuals agreed to participate in face-to-face interviews or an online survey using Google Docs. This study concluded that the vast majority of the sample population use the Internet and social media, and the latter involved 85% of people. Women make slightly more use of social networks than men, while youths are engaging with social media much more than older people; level of education does not seem to have any effect on the frequency of e-services usage [48].

The rationale for this study mainly stems from lacuna in the extant literature in terms of innovation adoption

systems studies in Middle East countries [19]–[22]. Studies show there is a need to investigate social, cultural, and religious factors that affect the behavioral acceptance and adoption of GRP system users in developing countries [22], [23], [25], [49]. Because most of these technologies have been designed and produced in Western countries [50], the largest market of such applications, according to Huang and Palvia [51], is the United States and European countries. Social and cultural and social factors have been reported a crucial factors in technology adoption in developing countries [52]. Technology uptake can be a failure if socio-cultural issues are not managed properly [22], [53]–[56].

The conceptual model developed for this study is based on existing technology acceptance theories, namely, 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 study develops an integrated research model based on the strengths and limitations of previous theories and models. The research collects data from a study sample of people working at the Ministry of Foreign Affairs (MOFA) in Saudi Arabia. The objective is to investigate some of the cultural and social factors influencing staff members' adoption of the GRP systems. The model incorporates the following: (i) cultural dimensions and social dimensions as determinants of the GRP systems acceptance and usage; (ii) the GRP systems usage as a determinant of the expected benefits; and (iii) certain demographic characteristics affecting the attitudes of individual employees.

A. OBJECTIVES OF THE STUDY
The objectives of this study are set out here below:

   a) To examine the impact of cultural values on the adoption of GRP systems by employees within organizations in Saudi Arabia.

   b) To examine the impact of social networks on the adoption of GRP systems by employees within organizations in Saudi Arabia.

   c) To examine the impact of peers' influence on the adoption of GRP systems by employees within organizations in Saudi Arabia.

   d) To examine the impact of religious values on the adoption of GRP systems by employees within organizations in Saudi Arabia.

   e) To examine the impact of attitude on the adoption of the GRP systems by employees within organizations in Saudi Arabia.

   f) To examine the impact of moderating factors on the adoption of GRP systems by employees within organizations in Saudi Arabia.

B. MOTIVATION OF THE STUDY
The aim of this study is to investigate the impact of socio-cultural and religious values on the adoption of GRP systems in Saudi Arabia. Very little research has explored the effects of socio-cultural factors on technology adoption in the Middle

East region [57]–[59]. The identification of socio-cultural factors is important to the government, organizations and policymakers wanting to create a workplace environment conducive to employees' adoption of technological innovation and thereby benefitting from it. This study extends research beyond these contextual variables, and it suggests that behavioral models are not universally the same across cultures [60], [61].

The assessment of technology acceptance in the context of Arab countries has generally escaped deeper scrutiny [37], [41], [59]. When comparing user behavior related to ICT adoption in Arab countries, adoption behavior is varied and nuanced [59], [62]–[64]. Employees in Saudi Arabia know relatively little about how socio-cultural aspects of life impact on technology acceptance. Except for a few studies [63], [65], not much is known about how cultural values affect consumers' adoption of innovation. For this reason, further research is required in order to fill the gap in our knowledge on this topic.

One of the most important factors that shapes the culture and values of people of Saudi Arabia is Islam, one of the world's major religions. Values are affected by the transmission of religious values, traditions, and norms. Religious oriented values are expected to exert a strong impact on the followers of a given faith [66]. The socio-cultural norms in Middle Eastern societies are very different from those in Western countries [67]. While Saudi Arabian cultural values originate in the teachings of Islam, these values have not been emphasized in the extant literature [66] with reference to the acceptance of technology.

II. THEORETICAL FRAMEWORK AND RESEARCH MODEL
The conceptual model of this study is based on the unified theory of acceptance and use of technology developed by Venkatesh *et al.* [32]; innovation diffusion theory by Rogers [68]; theory of reasoned action by Fishbein and Ajzen [69]; technology acceptance model by Davis [70]; and cultural dimensions theory devised by Hofstede [71]. Figure 1 depicts the conceptual research framework. Some of the theories have shown limitations in previous studies [14]. This study has developed an integrated model that takes into account existing theories and added a few new constructs based on culture and traditions in Saudi Arabia.

The basis of the Theory of Reasoned Action (TRA) conceptual model is the distinction between beliefs, attitudes, intentions and behaviors [7], [72]. According to the TRA model, attitudes and subjective norms determine a person's behavioral intention which ultimately leads to a specific behavior [7], [72]. The culture of Saudi Arabian society is completely different from those of Western countries. Saudi culture is a homogeneous one that has been hugely influenced over the course of many centuries by Islam and the tribal system [73]. This explains the need to develop a customized model to account for these different socio-cultural norms that could assist the innovation adoption process in the Middle Eastern region.
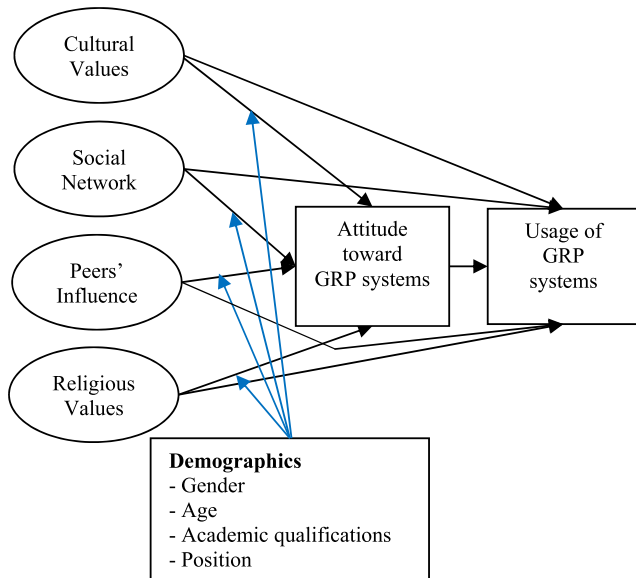
FIGURE 1. Conceptual research framework.

III. HYPOTHESES DEVELOPMENT

A. CULTURAL VALUES

Culture was acknowledged in previous studies as wielding a significant impact on technology adoption, specifically in developing countries such as those with Arab histories [38]. According to Jaafreh [74] national culture is an important issue in technology acceptance. Culture has a significant effect on the diffusion of technology [37], [38], [50]. A significant role is played by cultural background in affecting the uptake and use of new technology [75]–[78]. This leads to the following hypotheses being proposed:

H_{1a} : *Cultural values have an impact on the attitude towards GRP systems by organizations' employees in Saudi Arabia.*

H_{1b} : *Cultural values have an impact on the usage of GRP systems by employees in organizations in Saudi Arabia.*

B. SOCIAL NETWORK

Social network influence is defined as the extent of how one social group impacts on another's behavior in adoption of technology [50], [79], [80]. Social factors were found to be more significant than economic factors in driving individuals within organizations to embrace innovations [12], [81], [82]. Employees may accept an innovation not because of perceived social pressure but because of its usefulness [80]. Adoption of technological innovation is influenced by social factors. Anandarajan *et al.* [83] stated that social factors constitute a method that can encourage people to adopt technology. Thus, the following hypotheses are posited:

H_{2a} : *Social networks have an impact on the attitude towards GRP systems in Saudi Arabia.*

H_{2b} : *Social networks have an impact on the usage of GRP systems in Saudi Arabia.*

C. PEERS' INFLUENCE

Several studies reported that peers significantly influence the adoption of technological innovation [84]–[86]. Employees are influenced by their peers when an innovation enters the workplace [12]. They normally imitate this acceptance by looking at what their peers do [12], [13]. According to Cheung and Vogel [87] peers are influenced and learn things in the workplace by observing their friends and colleagues. Thus, the following hypotheses are proposed:

H_{3a} : *Peers' influence has an impact on the attitude towards GRP systems adoption in Saudi Arabia.*

H_{3b} : *Peers' influence has an impact on the usage of GRP systems in Saudi Arabia.*

D. RELIGIOUS VALUES

Saudi society's culture historically has mostly been influenced by Islam which has shaped the traditions, social norms, patterns, obligations, privileges and practices [58]. Researchers in the field of management have begun evaluating employees' religious beliefs as a significant aspect of management practices that cannot be underestimated [88]. Studies have found that religious values and teachings inspire employees in their daily conduct of activities and performance of responsibilities [89]. Therefore, the following hypotheses are suggested for testing:

H_{4a} : *Religious values have an impact on the attitude towards GRP systems in Saudi Arabia.*

H_{4b} : *Religious values have an impact on the usage of GRP systems in Saudi Arabia.*

E. ATTITUDE TOWARD THE ADOPTION OF GRP SYSTEMS

Weihrich and Koontz [90] stated that attitude towards a technology is a pre-condition of technology adoption. Lam, *et al.* [91] found that the intention to do so is affected by employees' attitudes. Lam *et al.* [91] and Talukder [7] found that adoption of technological innovation is strongly related to individual employees' attitude toward that innovation. A positive attitude is likely to persuade individuals to accept and continuously use a technological innovation [92]. Based on the above discussion the following hypothesis is suggested:

H_5 : *Attitude towards GRP systems has an impact on employees' usage behavior in organizations in Saudi Arabia.*

F. MODERATING VARIABLES (DEMOGRAPHICS)

Demographic factors are considered an important predictor that affects individual employees' attitude towards adoption of technological innovation [7], [13], [46]. For example, gender has been found to play a significant role in predicting new technology usage [32], [93]. There have also been mixed findings about whether males adopt innovation more than females, since the former are more skilled in using computers and attracted to them compared to their female counterparts [94], [95]. Some studies found that older generations have limited experience of and interest in using

computers compared to the young as they tend to avoid anxiety-provoking situations [94], [96], [97]. Level of education is another important determinant since it enables individuals to operate and appreciate innovation as well as relevant adequate knowledge required for that innovation [92], [96]. Therefore, the following hypothesis is adopted:

H_6 : *Demographic factors have a moderating effect on the relationship between cultural values, social networks, peers' influence and religious values and the attitude towards GRP systems in Saudi Arabia.*

IV. METHODS

The study investigates the perception and usage level of GRP systems be employees in Saudi Arabian government organizations. Data were collected using an online survey questionnaire from the Saudi Ministry of Foreign Affairs and diplomatic missions throughout the world. Items of the constructs were adopted from previously tested and validated measures in the relevant studies with appropriate modifications. To conduct the pilot study, the questionnaire was sent to one of the ministry's departmental employees who ranged in number from 150 to 200. Those who responded to the questionnaire totaled 45 and their questionnaires were treated and analyzed to confirm the validity and reliability of the instruments. The questionnaire was then randomly distributed by email to 1677 employees at the Ministry and diplomatic missions around the world. The number of those who responded was 377, which makes the response rate 22.48%. This response rate is considered to be sufficient according to Shamsuddoha [98], who stated that the number of respondents for any organizational study in a developing country context is relatively low where 20% could be very optimistic. The reason for the low response rate is that participation in this research was voluntary and there were no incentives associated with this survey to increase the response rate. Secondly, employees, particularly public servants in the Middle Eastern countries are not familiar with such research and they are reluctant to complete the survey questionnaire [99]. Out of the 377 questionnaires collected, 37 were considered unusable because they had missing response items. After excluding them the remaining 340 questionnaires were analyzed. The study employed multivariate statistical analysis on the collected data.

V. RESULTS AND DISCUSSION

A. RESPONDENTS' DEMOGRAPHICS

As shown in Table 1, 85.3% of participants were men while the number of women was only 14.7%. In the Ministry of Foreign Affairs, females constitute only 15% of the total workforce. With this percentage in mind, we could say that the number of women in the study sample is quite reasonable. Most of the respondents (53%) are in the middle age (30-39) group, followed by 24% in the 40-49 age group and 12% are in the 20-29 age group. More than 50% of the respondents hold a Bachelor's degree, followed by 27% with a Master's degree, 13% with a diploma and only 3% who achieved a

TABLE 1. Demographic characteristics.

Categories	Criteria	Frequency	Percent
Gender	Male	290	85.3%
	Female	50	14.7%
Age	20-29	42	12.4%
	30-39	180	52.9%
	40-49	83	24.4%
	>=50	35	10.3%
Academic Qualification	High school (Year 12)	10	2.9%
	Diploma	43	12.6%
	Bachelor	184	54.1%
	Master	91	26.8%
	PhD	12	3.5%
Position	Manager	74	21.8%
	Technician	70	20.6%
	Administrator	108	31.8%
	Contractor	51	15.0%
	Diplomat	37	10.9%
	Total	340	100%

PhD. Most respondents are administrators (32%) while 22% are managers. Among the respondents 21% are technicians, 15% are contractors and 11% work as diplomats. These results inform us that most respondents are male, middle aged, have a Bachelor's degree and work as administrators. Goodness-of-fit Chi-square tests were conducted, and the findings indicate that the sample is representative of the research population.

B. INTER-CORRELATION AMONG STUDY VARIABLES

Table 2 shows the Pearson correlation which measures the linear relationship between dependent and independent variables. The correlation matrix table shows that usage is significantly and positively related to cultural values (r=0.212, p<0.01), social network (r=0.364, p<0.01), peers' influence (r=0.346, p<0.01) and religious values (r=0.362, p<0.01). There is also a strong positive correlation between usage

TABLE 2. Inter-correlations among study variables.

	CUL	SOC	PEE	REL	ATT	USA
1. CUL	1	.095	.022	.094	.225**	.212**
2. SOC	.095	1	.432**	.269**	.393**	.364**
3. PEE	.022	.432**	1	.301**	.401**	.346**
4. REL	.094	.269**	.301**	1	.388**	.362**
5. ATT	.225**	.393**	.401**	.388**	1	.878**
6. USA	.212**	.364**	.346**	.362**	.878**	1

Legend: CUL= Cultural Values, SOC= Social Network, PEE=Peers' Influence, REL= Religious values, ATT= Attitude, USA=Usage

behavior and attitude toward the adoption (r=0.878, p<0.01). Results shows that correlation between independent and dependent variables ranges from r=0.212 to r=0.878, while correlations among all variables range from r=0.022 to r=0.878. This indicates there is no multicollinearity problem in the study. He and Freeman [93] stated that a high correlation generally of 0.90 and above in the correlation matrix is the first indication of substantial collinearity.

C. RELIABILITY AND VALIDITY

The validity and reliability of the factors were ascertained to establish if the factors are valid and reliable for further analysis [12]. Pre-testing of the research questionnaire is highly recommended to ensure that its items are clear, logical and understood by any normal respondent [100].

The first method is that the questions used in the measurement of this research model were based on validated items from previous studies, and then the survey questions were paraphrased to suit the research object. According to several studies [4], [32], [53], [101]–[106] there are different ways to validate the questionnaire. The second method used to establish if the factors are valid and reliable for further analysis is conducting a pilot study. 45 questionnaire responses were used to constitute the pilot study sample. Reliability analysis was conducted using SPSS for all the variables of the model. In SPSS, the most popular test of reliability is Cronbach's coefficient alpha [100] Hair et al. [107] stated that "the diagnostic measure is the reliability coefficient that assesses the consistency of the entire scale, with Cronbach's alpha being the most widely used measure" (p. 118). According Hair et al. [107] and Sekaran and Bougie [100], Cronbach's alpha value – to be acceptable - should be in the 0.7 range and this will then indicate adequate internal consistency, while reliability values between 0.8 and 0.9 are considered to be very good.

D. CONSTRUCTS' RELIABILITY

Internal consistency refers to the degree to which responses are consistent across the items (variables) within a single measurement scale [108]. To measure the internal consistency this study used Cronbach's coefficient alpha. Cronbach's coefficient alpha value was assessed to examine the internal research consistency of measuring [109]–[111]. According to Hair et al. [107] and Pallant [112] construct reliability should be 0.7 or higher to indicate adequate convergence or internal consistency. The higher reliability range suggests the collected data maintains a high level of internal consistency. As stated by Hair et al. [107] "the diagnostic measure is the reliability coefficient that assesses the consistency of the entire scale, with Cronbach's alpha being the most widely used measure" (p. 118). According to DeVellis [113] reliability values between .70 and .80 are deemed to be "respectable" whereas reliability values between .80 and .90 are "very good." Data shows that most of the instruments have strong reliability.

Results of the analysis in Table 3 shows that 5 of 6 constructs obtained a high or excellent reliability in Cronbach's α value results ranging between 0.779 and 0.927. One construct, which is social network, recorded a moderate reliability of 0.640. Hair, et al. [107] claimed "the generally agreed upon lower limit for Cronbach's alpha is .70, although it may decrease to .60 in exploratory research" (p. 118). The overall result confirms that most of the study instrument's alpha values are reliable and exhibit appropriate construct reliability.

TABLE 3. Cronbach's Alpha reliability results & items sources.

Factor	No. of Items	Cronbach's alpha	Comments	Sources
Cultural Values	4	0.906	Strong	Items are adapted from Alhirz and Sajeev [22], Wu [114], Zhao, et al. [115], Srite and Karahanna [116]
Social Network	5	0.640	Adequate	Items are adapted from Talukder [92],
				Lewis, et al. [117]
Peers' Influence	4	0.817	Robust	Adapted from the measures of Talukder [92], Lewis, et al. [117]
Religious Values	5	0.779	Fairly high	Items are adopted from Ab. Wahab, et al. [66]
Attitude	5	0.878	Reliable	Adapted measures from Al-Gahtani and King [72], Lam, et al. [91], Taylor and Todd [104]
Usage	6	0.927	Strong	Items are adapted from Al-Gahtani and King [72], Talukder [92], Igbaria, et al. [118] and Igbaria, et al. [119]

E. VALIDITY

To measure the validity of the survey instruments, the study used convergent and discriminant. Convergent validity is the extent to which items are thought to reflect one particular construct [111]. Table 4 shows constructs' convergent validity where factor loadings range from 0.613 to 0.938, which is considered adequate for the purposes of this study. According
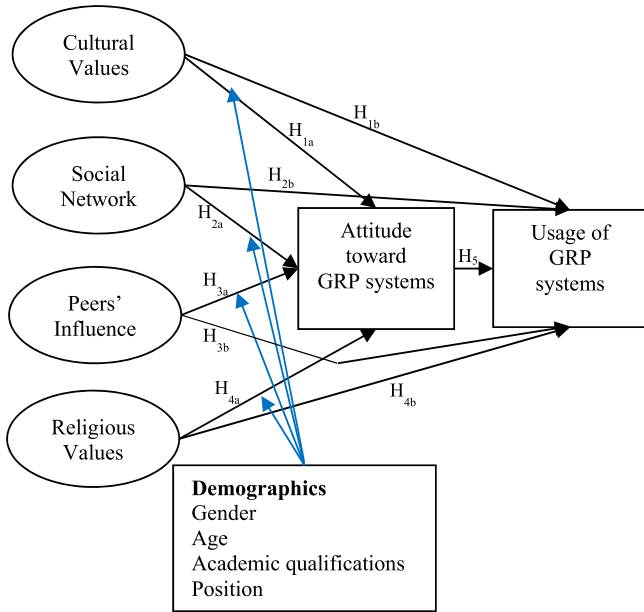
FIGURE 2. Hypothesized model.

TABLE 4. Results of reliability and convergent validity.

Factor	Factor loading	Cronbach's alpha	AVE
Cultural Values		.906	0.855
Cultural Value1	.862		
Cultural Value2	.881		
Cultural Value3	.886		
Cultural Value4	.807		
Cultural Value5	.835		
Social Network		.640	0.694
Social Network1	.701		
Social Network2	.613		
Social Network3	.708		
Social Network4	.749		
Peers' Influence		.817	0.762
Peers' Influence1	.745		
Peers' Influence2	.705		
Peers' Influence3	.815		
Peers' Influence4	.833		
Peers' Influence5	.705		
Religious Values		.779	0.735
Religious Value1	.646		
Religious Value2	.749		
Religious Value3	.813		
Religious Value4	.708		
Religious Value5	.746		
Attitude		.878	0.821
Attitude1	.852		
Attitude2	.817		
Attitude3	.833		
Attitude4	.785		
Attitude5	.815		
Usage		.927	0.860
Time	.849		
Frequency	.938		
Features	.803		
Ticketing	.893		
Services	.836		
Training	.834		

AVE (Average Variance Extracted) = Square Root (SUM(Communalities)/N)

to Bagozzi and Yi [120], AVE should be above at least 0.5. Moreover, an AVE in excess of 0.5 generally signifies appropriate convergent validity [121]. On the other hand, discriminant validity is adequate when AVE (average variance extracted) is higher than 0.50, which indicates at least 50% of the measurement variance is captured by the constructs [122]. Results shows that the AVE score ranged between 0.694 and 0.860, which is greater than the recommended score and therefore, instruments have achieved an acceptable level of discriminant validity.

VI. DISCUSSION OF HYPOTHESES TESTING

A. HYPOTHESES 1A AND 1B
Hypotheses 1A and 1B examine the impact of cultural values on the employees' attitude towards and usage of the GRP system in the workplace. Results show that cultural values wield a significant impact on both perception and usage behavior of employees with reference to the acceptance of GRP systems. Findings indicate that cultural values wield a strong and positive influence on employees' adoption of technological innovation. The results are supported by prior studies, for example Al-Jumeily and Hussain [123] found a positive relationship between technology acceptance and cultural values in the Middle Eastern context. Figure 3 depicts the test of the proposed study model.

B. HYPOTHESES 2A, 2B, 3A AND 3B
Hypotheses 2A and 2B were proposed to examine the impact of social influence while hypotheses 3A and 3B were established to test the effect of peers' influence on employees' attitude to and usage of GRP system in the Ministry of Foreign Affairs in Saudi Arabia. Tables 5 and 6 show the results which indicate that social network and peers have a strong

and positive influence on employees' perception and usage of GRP. Findings corroborate other studies [124]–[126] in that employees are inspired by their friends within their social networks as well as colleagues in their workplace. Furthermore, Talukder *et al.* [12] and Cheung and Vogel [87] found that peers play a strong role in educating their colleagues on how
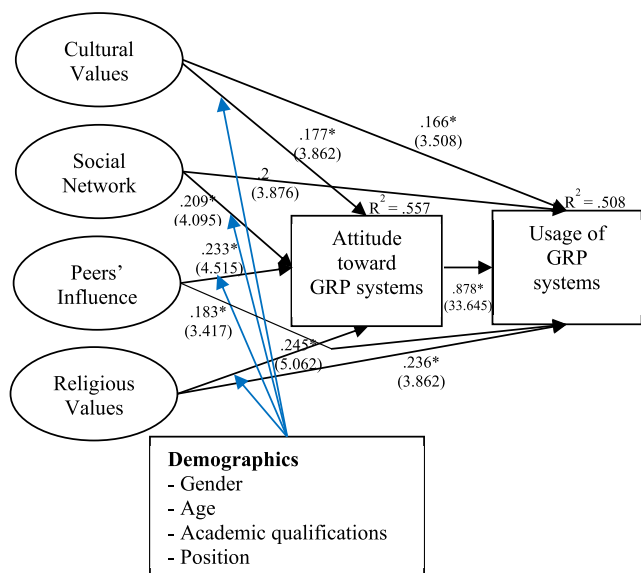
FIGURE 3. Test of the proposed model. Regular numbers represent standardized weight. Numbers inside the brackets represent critical values. Italicized numbers represent variance explained *p = .001.

to use the new system effectively. Table 8 summarizes the results of hypotheses testing.

C. HYPOTHESES 4A AND 4B

Hypotheses 4A and 4B examine if the religious values have any impact on attitude toward and usage behavior of GRP systems in the workplace. The results indicate that the impacts of religious values on both attitudes and usage of GRP systems are statistically significant. Findings show that individual employees' attitudes are highly influenced by their religious orientations. Generally, in the Middle East, employees' behavior is affected by their religious values and they tend to abide by religious instructions even in the case of technology adoption. The results are shown in Tables 5 and 6.

TABLE 5. Regression model for socio-cultural and religious factors and attitudes toward GRP systems.

Independent Variables	Unstandardized Coefficients (B)	Standardized Coefficients Beta	T	R^2	F	Sig.
				.557	26.297	.000*
(Constant)	-8.801E-17		.000			1.000
Cultural Values	.177	.177	3.862			.000*
Social Network	.209	.209	4.095			.000*
Peers' Influence	.233	.233	4.515			.000*
Religious Values	.245	.245	5.062			.000*

Dependent Variable: Attitude

D. HYPOTHESIS 5

Hypothesis 5 was proposed to identify whether employees' attitude has any impact on system usage behavior. The results in Table 7 are evidence that attitude does strongly impact on the usage of GRP systems. Findings were supported by prior

TABLE 6. Regression model for socio-cultural and religious factors and GRP systems usage behavior.

Independent Variables	Unstandardized Coefficients (B)	Standardized Coefficients Beta	T	R^2	F	Sig.
				.508	29.202	.000*
(Constant)	1.038E-16		.000			1.000
Cultural Values	.166	.166	3.508			.001*
Social Network	.206	.206	3.876			.000*
Peers' Influence	.183	.183	3.417			.001*
Religious Values	.236	.236	4.698			.000*

Dependent Variable: Usage

TABLE 7. Regression model for GRP systems usage behavior.

Independent Variables	Unstandardized Coefficients (B)	Standardized Coefficients Beta	T	R^2	F	Sig.
				.878	1131.954	.000*
(Constant)	1.863E-16		.000			1.000
Attitude	.878	.878	33.645			.000*

Dependent Variable: Usage

TABLE 8. Summary of the results of hypotheses testing.

Hypotheses	Path Direction	St. Estimate	CR	P	Result
H$_{1a}$	CUL → ATT	.177	3.862	0.000*	Supported
H$_{1b}$	CUL → USA	.166	3.508	0.001*	Supported
H$_{2a}$	SOC → ATT	.209	4.095	0.000*	Supported
H$_{2b}$	SOC → USA	.206	3.876	0.000*	Supported
H$_{3a}$	PEE → ATT	.233	4.515	0.000*	Supported
H$_{3b}$	PEE → USA	.183	3.417	0.001*	Supported
H$_{4a}$	REL → ATT	.245	5.062	0.000*	Supported
H$_{4b}$	REL → USA	.236	4.698	0.000*	Supported
H$_5$	ATT → USA	.878	33.645	0.001*	Supported

Legend: CUL= Cultural Values, SOC= Social Network, PEE=Peers' Influence, REL= Religious Values, ATT= Attitude, USA=Usage
Results significant at: *p= .001
Model fit: For Attitude R^2=.557; Usage R^2=.508

research which indicates that employees' positive perception of an innovation affects the acceptance and continuous usage of the system [72], [91], [127], [128]. When an individual employee has a favorable attitude toward a system, he or she is likely to use the system in their daily work activities. Therefore, this hypothesis is supported in the model.

E. HYPOTHESIS 6

Hypothesis 6 examines the moderating effect of demographic characteristics (gender, age, education qualification, and job position) on the relationship between cultural values, social networks, peers' influence, and religious values on the attitude toward the use of GRP systems in Saudi Arabia.

Table 9 below summarizes the results for the effect of demographic aspects on moderating the relationship between the four variables (cultural values, social networks, peers influence, and religious values) and the attitude regarding the usage of GRP systems by employees at the Ministry of Foreign Affairs in Saudi Arabia. It is evident that age wields

TABLE 9. Moderation effect.

Dependent Variable	Primary Predictor Variable	Moderating Variable	Primary Predictor and Moderator Product Variable	Standardized Coefficients		t-Value	Significance	F- Value
Attitude Towards GRP	Cultural Values	Gender	Cultural Values*Gender	Cultural Values	.008	.041	.967	7.67** (.000)
				Gender	-.131	-.733	.464	
				Cultural Values*Gender	.302	1.329	.185	
	Cultural Values	Age	Cultural Values*Age	Cultural Values	**.652**	**2.387**	**.018a**	7.85** (.000)
				Age	**.432**	**1.984**	**.048a**	
				Cultural Values*Age	**-.587**	**-1.627**	**.105b**	
	Cultural Values	Qualification	Cultural Values*Qualification	Cultural Values	.185	.840	.401	6.236** (.000)
				Qualification	.008	.037	.970	
				Cultural Values*Qualification	.057	.193	.847	
	Cultural Values	Position	Cultural Values*Position	Cultural Values	.288	2.301	.022	6.310** (.000)
				Position	.135	.765	.445	
				Cultural Values*Position	-.108	-.530	.596	
	Social Network	Gender	Social Network*Gender	Social Network	.408	2.347	.019	19.660** (.000)
				Gender	.080	.231	.817	
				Social Network*Gender	-.057	-.147	.883	
	Social Network	Age	Social Network*Age	Social Network	**.712**	**3.219**	**.001a**	21.257** (.000)
				Age	**.528**	**1.769**	**.078b**	
				Social Network*Age	**-.597**	**-1.551**	**.122b**	
	Social Network	Qualification	Social Network*Qualification	Social Network	.414	2.066	.040	19.723** (.000)
				Qualification	.085	.260	.795	
				Social Network*Qualification	-.058	-.152	.879	
	Social Network	Position	Social Network*Position	Social Network	.456	3.926	.000	19.922** (.000)
				Position	.249	.781	.435	
				Social Network*Position	-.223	-.668	.505	
	Peers' Influence	Gender	Peers' Influence*Gender	Peers' Influence	.527	2.862	.004	21.792** (.000)
				Gender	.290	.847	.397	
				Peers' Influence*Gender	-.279	-.723	.470	
	Peers' Influence	Age	Peers' Influence*Age	Peers' Influence	.698	2.727	.007	23.649* (.000)
				Age	.484	1.510	.132	
				Peers' Influence*Age	-.488	-1.193	.234	
	Peers' Influence	Qualification	Peers' Influence*Qualification	Peers' Influence	**.724**	**3.298**	**.001a**	22.541** (.000)
				Qualification	**.541**	**1.644**	**.101b**	
				Peers' Influence*Qualification	**-.590**	**-1.515**	**.131b**	
	Peers' Influence	Position	Peers' Influence*Position	Peers' Influence	.370	2.853	.005	213.305** (.000)
				Position	-.066	-.207	.836	
				Peers' Influence*Position	.084	.246	.806	
	Religious Values	Gender	Religious Values*Gender	Religious Values	**.634**	**3.784**	**.000a**	21.560** (.000)
				Gender	**.793**	**1.610**	**.108b**	
				Religious Values*Gender	**-.783**	**-1.514**	**.131b**	
	Religious Values	Age	Religious Values*Age	Religious Values	.238	1.021	.308	21.793** (.000)
				Age	-.232	-.467	.641	
				Religious Values*Age	.365	.658	.511	
	Religious Values	Qualification	Religious Values*Qualification	Religious Values	.604	3.050	.002	20.792** (.000)
				Qualification	.565	1.146	.253	
				Religious Values*Qualification	-.601	-1.114	.266	
	Religious Values	Position	Religious Values*Position	Religious Values	.416	3.376	.001	20.538** (.000)
				Position	.148	.288	.774	
				Religious Values*Position	-.109	-.208	.835	

a Significant at the 5% level of significance
b Significant at the 10% level of significance
** Significant at the 5% level of significance
* Significant at the 10% level of significance

a significant moderating effect on the relationship between the cultural values and the attitude shown by employees when using the GRP systems. This outcome supports the outcome documented by Talukder *et al.* [99] who found that age has a significant moderating impact on the correlation between cultural values and perception toward GRP system adoption. It further emerged that age has a moderating impact on the connection between social networks and the attitude concerning the use of the GRP systems by employees in Saudi Arabia. This finding for age supports the conclusion of

Elias *et al.* [129] who detected a significant moderating effect of age on attitude towards the use of technology. Another demographic academic qualification has a moderate moderating effect on the relationship between peers' influence and the attitude toward acceptance of GRP systems. This result supports Abu-Shanab [130] who discovered that education level significantly moderates the relationships between behavioral intention and technology use.

The remaining demographic variables were not found to have any significant moderating effect on the relationship between the rest of the variables and the attitude toward the use of the GRP systems by Ministry of Foreign Affairs employees. This outcome supports the findings of Baker *et al.* [49] who stated that demographic variables (e.g. gender and age) have been reported to be significant moderators of the influences of attitude and subjective norm. Furthermore, perceived behavioral control on behavioral intention in other cultural samples were found to be non-significant in the Saudi Arabian sample. The authors speculate that these results are due to the more homogeneous (young, male, educated) workforce that exists in Saudi Arabia.

The reason for this finding is as follows - the typical professional worker in Saudi Arabia is under the age of 40 and well educated. There is no reason to expect that the moderation of attitude with gender, with age, or with level of education, upon the intention to use technology, will be significant in Saudi Arabia. Indeed, the homogeneity of the professional Saudi workforce as predominantly young and well educated would not suggest any likely moderating effects of age or education with subjective norm on intention to use IT [24].

VII. CONCLUSION AND IMPLICATIONS

The study investigates the impact of users' socio-cultural values and religious orientation on GRP systems usage in the Kingdom of Saudi Arabia. Results show that all the hypotheses concerning the effect of the cultural, social, peers, and religious did have a significant effect on both the attitude regarding the use of GRP systems and actual systems usage. The hypothesis concerning the moderating effect of demographics revealed that age did moderate the relationship among cultural values and social values and the attitude toward the system usage. In addition, education qualification was found to have a moderating impact on peers' influence and employees' perceptions of technology acceptance. It is interesting to note that results of the study revealed gender and job position having no significant effect on any determinants of attitude towards GRP system adoption. Our search of the literature reveals mixed results as to whether gender has any impact on technology adoption in the workplace. For example, some studies, such as that by Choudrie and Dwivedi [131] found gender exerts no significant impact on innovation adoption while other studies, for example Goswami and Dutta [132] noted a significant impact on technology adoption. While such differences in findings may be attributed to the contexts in which research

is conducted, our analysis clearly indicates that impact of socio-cultural and religious factors on the adoption of GRP systems does not depend on employees' gender or position in the workplace. These findings suggest that both males and females, irrespective of their job position (high and low) are driven by socio-cultural and religious imperatives in using innovative systems in their respective workplaces.

Results show that cultural values and religious orientation have a strong effect on the adoption of GRP systems in the Saudi Arabian workplace. As a traditional society, individual employees are willing to adopt a system when it does not contradict or conflict with their society's religious and cultural values. Since the cultural and religious values are important to employees, managers may initiate professional social and cultural clubs so that workers can have informal communications or raise any concerns with their colleagues about any innovation that organizations intend to implement. Managers need to recognize employees' cultural and religious values when they propose to introduce a technological innovation.

Colleagues within the social network and peers in the workplace play a crucial role when a new technology is being implemented. Individual employees obtain knowledge, information and features about an innovation from their peers and people in their social networks. Perceptions about new technology are highly influenced by the support, motivation and encouragement generated by their colleagues and peers. Organizations should facilitate such peer support structures when introducing new innovations, the aim being to develop awareness, application and potential benefits of the new systems. Peer support groups should be provided during the initial implementation of any new technology. When individual employees feel that the new system is supported by the peers and colleagues, they will be comfortable with applying it in their workplace and encouraged to develop a positive attitude to the innovation.

A. LIMITATIONS AND FUTURE DIRECTIONS OF RESEARCH

Like many other studies this study has several limitations. The research was conducted in a single public sector organization in Saudi Arabia. If similar research was carried out in another organization, it might show different outcomes as socio-cultural and religious values would probably vary according to the context of the study. Findings of the study may not be generalizable to other organizational contexts as environmental settings and factors might differ. Limitations may also exist in the comparative analysis between private and public sector institutions. Such comparative studies could enrich the analysis and build on the findings documented in this research. This study did not extend to other areas such as the private sector or service sector so our understanding of the adoption of GRP systems and its usage level are not considered to be broad. Due to certain time constraints, this study did not employ a qualitative research approach. In order to further enrich the model, the researcher could use the qualitative approach to provide deeper insights into innovation adaptation and usage level. Qualitative information

could enhance our understanding of the factors affecting the adoption of technological innovation.

The study provides guidelines and directions for researchers to undertake future research work in the area of innovation adoption. Future research could consider more independent factors affecting employees' perceptions of the adoption of a technological innovation. Organizations around the world have been witnessing ongoing and rapid technological advances in their operations and service departments. It is therefore very important to continuously monitor and study these driving forces that are shaping and changing the innovation adoption process. A comparative study can be conducted to understand the different adoption processes that public and private sector organizations employ. Comparative studies could also be conducted within developed and developing countries to find any variations in adoption or the new determinants of technology acceptance. Furthermore, future studies could observe the differences in the impact of socio-cultural and religious values on technology acceptance in other Gulf nations.

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