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 SURVEY

Do Religious Values Influence the Decision of Saudi Arabian Public Sector Employees to Adopt Government Resource Planning Systems?

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ABSTRACT This research aims to investigate the impact of religious values on the adoption of Government Resource Planning (GRP) systems by public sector employees in Saudi Arabia. The study also explores the impact of demographic characteristics as moderating factors between the religious factors and perceptions of GRP systems in Saudi government agencies. Not many studies have been conducted on religious values concerning to what extent technological innovation is embraced. Most research on the effects of cultural norms has been conducted in Western countries and little has been published on Arab nations. This research fills that knowledge gap by investigating the effect of religious values on public sector employees' adoption of technological innovation in Saudi Arabia. Theoretically, this study related to religious factors will facilitate an understanding of the issues affecting individual employees' adoption of new technologies in the workplace context where conservative social and religious values hold sway. The study developed a conceptual model based on two theories: Unified Theory of Acceptance and Use of Technology and Theory of Reasoned Action. The sample data comprised 340 responses to an online survey questionnaire sent to employees at the Ministry of Foreign Affairs, Saudi Arabia. Data were analyzed using multivariate statistical analysis. Results show that 37% of the variance ($R^2 = .372$) of employees' attitudes to GRP application can be explained by the effect of religious variables. Findings show that the religious factors - perfection (Itqan) ($t(340) = 7.678, p < 0.000$), cooperation (Ta'awun) ($t(340) = 4.007, p < 0.000$), and transparency (Shaffaf) ($t(340) = 4.700, p < 0.000$) exerted a significant effect on users' attitude to the system's usage. However, responsibility (Mas'uliyah) ($t(340) = 1.284, p < 0.200$) did not reveal any level of significance. This research will help managers identify and benchmark strategies to motivate technology adoption in their workplaces and customize them to best fit their users' unique characteristics in a traditional and conservative society such as Saudi Arabia. Contributions, implications, limitations of this study and what future research could pursue are highlighted in the paper.

INDEX TERMS Religious values, unified theory of acceptance and use of technology, theory of reasoned action, perfection, cooperation, government resource planning systems, attitude towards GRP systems, system usage.

I. INTRODUCTION

The use of Information and Communication Technology (ICT) has grown enormously in the last 10 years, with

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computers and smart devices becoming indispensable to daily life [1]. ICT leads to significant changes in productivity, structural changes, profitability and competitiveness of business organizations [2], [3], [4], [5], [6], [7]. User acceptance of technology has been viewed as an essential factor in determining the success or failure of any information system

being implemented [8]. Understanding users' acceptance of technological innovation is a vital part of this process [9]. It is so important to comprehend how people accept and adopt new technologies in the workplace [10]. Technology needs to be accepted and used properly, otherwise it will be of little value [11], [12], [13].

Studies have argued that religious values constitute an important factor influencing how individual people accept, use, and react to new technology [14], [15]. Literature has shown that religious values are key determinants in accepting technology [16], [17] and found a significant correlation between them [15], [17], [18], [19]. This is even more true when considering the Middle Eastern countries where conservative cultures, traditions and religion greatly shape people's lives. Religion plays an important role in shaping people's values, beliefs, knowledge and attitudes. Thus, religious commitments, beliefs and values influence the feelings and attitudes of people when innovation presents itself [20]. Only a few published studies have explained the impact of religious views on the spread of information technology in Arab nations [21], [22]. These values affect individual employees whether or not the innovation will be embraced in the workplace [23], [24]. For this reason, it is important to study the impact of religious values on the acceptance of technological innovation in Middle East countries and the industries operating in them.

This study is an empirical investigation with its sample being employees at the Ministry of Foreign Affairs, Saudi Arabia. One of the most important factors that shape the lives of Saudi people is the Islamic religious faith and its values. Individuals' values are influenced and guided by the transmission of religious precepts, practices and norms [25]. Religious norms in Middle East societies are largely different from Western countries [26], except those in the region that also practice the Christian faith. The Middle Eastern and particularly Saudi religious values are based on the teachings of Islam, and the impact of such values has not been greatly explored in the extant literature [25].

Saudi Arabia is considered a developing country and dominates most of the Arabian Peninsula. Saudi Arabia has experienced rapid and dramatic changes in economic and social development since the Second World War, especially since the booming oil prices of the 1970s [27]. Saudi Arabia is currently experiencing rapid growth and change in terms of economy, education and technology, still made possible by the dependence on oil revenues [17]. In the year 2000, Saudi Arabia witnessed a microelectronic revolution that resulted in improved means of communication, such as satellite television, mobile phones, and the Internet [27]. The current acceptance rate of the Internet is about 93% in Saudi Arabia and since then, online and other technology applications have remained popular throughout Saudi Arabia [15], [28].

The GRP system has become one of the most important fields under the information systems umbrella. It is an integrated software package that includes all business functions required to execute workplace procedures. Middle Eastern

countries particularly the Saudi Arabia is a potential market for GRP system adoption [29], [30]. Technology in Saudi government organizations, departments, etc., is still in its infancy compared to the Western economies. The senior managers of these organizations have a lot to learn about new systems. The core motivation for the Saudi government to implement the GRP in its agencies is to improve their efficiency and effectiveness [30]. This study investigates the impact of religious factors on the acceptance and usage of the GRP in Saudi Arabian public sector organizations. Only a few studies have been done to assess the impact of religious values on GRP systems in the Middle Eastern countries, and more work in this area is required [31], [32], [33], [34], [35], [36], [37], [38].

A. OBJECTIVES OF THE STUDY

The overarching research question is as follows: Do religious values impact the decision to adopt GRP systems? The specific research objectives are as follows:

- a) To investigate the impact of religious values on GRP systems adoption by public sector employees in Saudi Arabia.
- b) To assess the perceptions of GRP systems and their usage by public sector employees in Saudi Arabia.
- c) To explore the impact of demographic characteristics between the religious factors and Saudi public sector employees' perceptions of GRP systems.

B. STUDY MOTIVATION AND CONTRIBUTION

Many studies on cultural values have been conducted in developed countries compared to the still developing nations, particularly in Middle Eastern countries [33], [35], [36], [37]. This research attempts to fill that research gap by examining the effect of religious values on employees' acceptance of technological innovation in Saudi Arabia. The study will enhance our knowledge of what is happening in workplace settings in a specific Middle Eastern country context. The conceptual model developed in this study related to religious factors will help greater technology adoption and facilitate an understanding of the factors affecting individuals' adoption of innovation in Saudi Arabia. In theory, such research will enrich the relevant literature by addressing a construct that combines adoption issues into one coherent model. In addition, this research helps managers identify and develop strategies to promote technology adoption in their organizations and customize the strategies to fit the distinctive characteristics of what organizations do. The research will also provide recommendations and ideas for the government, public and private sector organizations to generate policies and practices that govern technology acceptance and usage in Saudi Arabia.

This research provides a better and deeper understanding of the impact of religious values on technology adoption by individual employees in Saudi Arabia. The study is expected to provide greater insights concerning how religious values affect employees' technological innovation adoption behavior. Middle Eastern countries are a perfect example of

strong religious values in all aspects of individuals' lives, work, and cultural traditions. The study emphasizes the impact of national values, which shape individuals' social and personal traits. These characteristics are responsible for affecting the acceptance and usage of technological innovations in Saudi Arabia. The results are expected to provide a theoretical explanation for the acceptance of technological innovations in Arab countries since they share similar languages, religions, cultures and traditions. This study provides a suitable reference for researchers who want to understand the impact of religious values on individuals' perceptions of technological innovation and usage behaviors.

II. THEORETICAL FOUNDATION AND CONCEPTUAL RESEARCH MODEL

The model devised for this research is based on two theoretical models: Unified Theory of Acceptance and Use of Technology (UTAUT) devised by Venkatesh *et al.* [39]; and the Theory of Reasoned Action (TRA) by Fishbein and Ajzen [40]. The model integrates these two existing theoretical models with some additions and modifications to suit the religious character of Saudi Arabia. The UTAUT has been criticized for its inability to measure acceptance of technology outside the boundaries of organizations and other workplace environments [17]. Still, this analysis suggests that in Saudi Arabia, there are religious factors that might influence the acceptance of innovations and that require further investigation.

The TRA conceptual model provides the basis of the distinction of beliefs, attitudes, intentions and behaviors of individual in technology adoption [13], [41]. As stated in TRA model, any individual's performance of a specific behavior is determined by their behavioral intentions to perform the behavior, and an intention to do is jointly determined by the person's attitude and subjective norms [13], [41]. The factors used in these theories can fit very well in Western societies, but the religious values of Saudi Arabia are completely different from the West. For centuries, the social values in Saudi Arabia inculcated a homogeneous culture and religious mindset made possible by Islam, the tribal system, ethnic and familial/clan loyalties [42]. Hence, there is a need for developing an updated research model to account for these social values, and contrast these to what is written in the existing literature.

Religious values are one of the crucial dimensions that distinguish Middle Eastern societies from Western ones [15]. This category is similar to social influence in the UTAUT model devised by Venkatesh, Morris, Davis, and Davis [39], and the beliefs that are inherent in the Fishbein and Ajzen's [40] TRA model. Fishbein and Ajzen [40] state that people may form different beliefs about the consequences of performing a behavior and different normative beliefs based on different experiences. These beliefs, in turn, determine attitudes and subjective norms, which then determine the intention and the corresponding behavior. These religious values include perfection (Itqan), cooperation (Ta'awun), responsibility (Mas'uliyah) and transparency (Shaffaf).

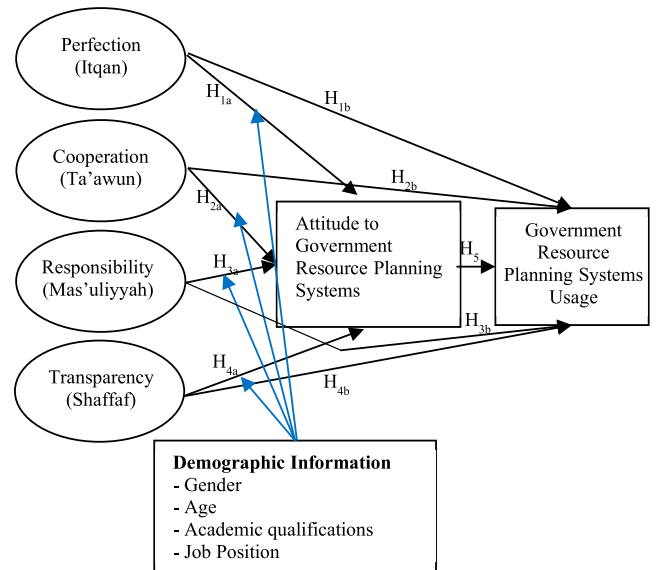


FIGURE 1. Proposed conceptual research framework.

Attitude is the second stage of the TRA model as stated by Fishbein and Ajzen [40]. The foundation of the TRA conceptual framework is provided, according to Al-Gahtani and King [41], by the distinction between beliefs, attitudes, intentions and behaviors. The third category comprises the demographic characteristics that moderate the relationship between religious factors and people's attitudes to accepting technological innovations. These demographics factors are similar to the UTAUT model developed by Venkatesh, Morris, Davis, and Davis [39]. These demographic characteristics categories include gender, age, academic qualification, and position in the workplace. The study did not include the specific construct behavioral intention in the model which has been used in the UTAUT and TAM according to what Thompson, *et al.* [43] argue. Their study investigates usage behavior, yet the model should not include behavioral intention and link attitude directly to actual behavior. They argued that behavioral intention should be excluded from the model when studies are interested in actual behavior. Al-Gahtani and King [41] stated that the actual behavior has already taken place in the past, while behavioral intention deals with future behavior. Since this study is interested in measuring actual behavior, it has removed behavioral intention and linked attitude directly to actual usage behavior.

The model developed here is deemed to be suitable for application to Saudi society. The proposed model is depicted in Figure 1. The arrows highlight the relationship among constructs and the hypotheses established for each relationship.

III. DEVELOPMENT OF HYPOTHESES

A. RELIGIOUS VALUES

Religion as a source of values is evident in many faiths, such as Roman Catholicism, Buddhism, Taoism, Judaism, Protestantism, and Islam [25]. For example, in the teachings of Islam, a Muslim should practice good deeds to

obtain the blessings and mercy of God, help other creatures of this Earth, be responsible for the wellbeing of society and do not harm others [44]. Empirical research has shown positive results concerning the impact of values on employees and organizational performance [25], [45]. Values directly influence behavior [46], [47]. Islamic values in the workplace are applicable universally and compatible with current management styles [25], [48], [49]. For instance, in the Malaysian approach to economic development, this was achieved through a unique combination of Islamic reforms [50]. According to Lawrence [50], economic growth and development are seen as the central goal of “Malaysian Islamic Reforms” [25]. By applying Islamic work values, Malaysia was able to overcome the problems of unethical work behaviors and inefficiency. This helped Malaysia emerge from the Asian Financial Crisis of 1997-98 faster than other countries in the region [51].

Islamic values have important implications for managers and leaders in Arab countries [47], [52], [53], [54], [55]. Al-sharif [56] stated that the significance of understanding the impact of Islamic principles and values on organizations should not be underestimated. Al-Omar [57] and Ibn Baz *et al.* [58] stated that for organizations to function well in the Muslim world, the main inspiration must come from Islamic teaching and values. The guiding principles for good moral and social conduct are applicable to management and business [59]. Many successful organizations are run on religious principles [15]. Such success stories of many companies are evident in Malaysia, and those committed to Islamic beliefs tend to refuse any unethical conduct in their daily operations [60], [61], [62].

1) PERFECTION (ITQAN)

Mashlah [47] described perfection (Itqan), which in Islam refers to the act of worshipping. Wahab, Quazi, and Blackman [25] described the word Itqan as an Arabic word for perfectionism. Literally, it means arranging and disposing of things in a scientific and logical way to get the perfect outcome [15]. She explained this word as the attitude of being careful, meticulous, hardworking and excellent in carrying out responsibilities and tasks. She considered efficiency, clear objectives, and an effective working style as evidence of the desire for Itqan (perfection). According to Farg *et al.* [63], perfection can also be linked to the concept known as Total Quality Management (TQM). Perfection (Itqan), according to Mashlah [47], will increase the need for innovation and creativity as a result of striving for perfection so that individuals and the community benefit. Technology enables employees to improve their workplace performance and accuracy, thus minimizing errors. This leads us to assume that perfection is an important factor that affects the attitude to technological innovation and usage by employees. Based on the above arguments, the following hypothesis has been proposed:

H1a: Perfection (Itqan) has an impact on the attitude to GRP systems by public service employees in Saudi Arabia.

H1b: Perfection (Itqan) has an impact on the usage of GRP systems by public service employees in Saudi Arabia.

2) COOPERATION (TA'AWUN)

The word Ta'awun is defined as the divine commandment for people to work together to achieve peace, harmony and a civilized society [64], [65], [66], [67], [68]. According to Wahab, Quazi, and Blackman [25], Ta'awun is an Arabic word meaning cooperation undertaken to achieve something. The concept of Ta'awun is considered to be very important in Islam and means not doing something which is detrimental to others. Sarif [68] described cooperation (Ta'awun) and competition as useful for creating and sustaining competitive advantage. Strategic Ta'awun or high-functioning cooperation between businesses helps them to improve market share [68]. Thus, cooperation and teamwork are encouraged and helped by technology. In the design phase, technological systems are accomplished by teamwork. In the implementation phase, the system is run by a number of people working in different departments/sectors/agencies [15]. Based on this, cooperation can be considered as important in influencing employees' adoption of technological innovations. As such, the following hypothesis has been devised:

H12: Cooperation (Ta'awun) has an impact on the attitude to GRP systems by public service employees in Saudi Arabia.

H2b: Cooperation (Ta'awun) has an impact on the usage of GRP systems by public service employees in Saudi Arabia.

3) RESPONSIBILITY (MAS'ULIYAH)

Mas'uliyah is an Arabic word that means responsibility [15]. From the Islamic point of view, the concept of management accountability has two dimensions: firstly, a manager or worker is accountable to his/her immediate boss; and secondly, that person is obliged to feel responsible to God after leaving this world [25]. Rozlan *et al.* [69] and Rezaeian [70] described responsibility (Mas'uliyah) as the force that binds action demanded by a leader. In the Islamic world, a Muslim manager or worker must have a good sense of duty and take responsibility. Technological systems like the Decision Support System (DSS) make decisions responsible, which helps improve how work is done. Individual employees with a sense of responsibility will do something good, and the activities will benefit the people and the organization [15]. We can therefore state that responsibility may affect employees' decision to embrace innovation in Saudi Arabia. Therefore, the following hypothesis has been proposed:

H3a: Responsibility (Mas'uliyah) has an impact on the attitude to GRP systems by public service employees in Saudi Arabia.

H3b: Responsibility (Mas'uliyah) has an impact on the usage of GRP systems by public service employees in Saudi Arabia.

4) TRANSPARENCY (SHAFFAF)

The Arabic word “shaffaf” means the ability to see through something (transparent). Transparency allows the public to gather information about daily affairs that affect them, and they have been fully informed about them [71]. The principle guarantees freedom of access or for any person to obtain information about specific incidents or events [72]. Technically it means putting things into writing and keeping good records [25]. The Holy Quran refers to putting transactions into writing and having witnesses in the following verse: “O ye who believe, when you deal with each other, in transactions involving future obligations in a fixed period of time, reduce them to writing. Let a scribe write down faithfully as between the parties: let not the scribe refuse to write: As Allah has taught him, so let Him write...” (Baqarah 282). Several studies stated that transparency can reduce corruption [15], [73], [74], [75], [76]. Technology enables employees to make informed decisions and this will improve the element of transparency. Also, a new and superior system enhances the degree of accuracy in terms of making fully disclosed decisions. Based on this concept, we claim that transparency affects individuals’ innovation acceptance decisions. Therefore, the following hypothesis has been proposed:

H4a: Transparency (Shaffaf) has an impact on the attitude to GRP systems by public service employees in Saudi Arabia.

H4b: Transparency (Shaffaf) has an impact on the usage of GRP systems by public service employees in Saudi Arabia.

B. ATTITUDE TOWARDS GRP SYSTEMS

Attitudes to information systems have been extensively studied [13]. A favorable attitude is likely to encourage individual employees to adopt and use the innovation [13]. Studies found that employees are more likely to perform a behavior if they possess a positive attitude but are more likely not to do so if or when they possess a negative attitude. Kwok and Gao [77] and Lam *et al.* [78] stated there is a very strong link between attitude and the adoption of new technologies. It is evident that there is a strong correlation between behavioral attitude and actual behavior [79], [80]. Alam and Uddin [81] supported this, and they contended that the practical use of new technologies by employees depends entirely on how they perceive it. A positive attitude is a significant predictor of the actual usage of new systems [81], [82], [83]. A meta-analysis by Legris *et al.* [84] discovered a positive relationship between behavioral attitude and actual usage in most studies [81]. It is worth noting here that only a limited number of studies are available on the influence of users’ attitudes to GRP adoption [81]. Thus, the following hypothesis is developed for this study:

H5: Attitude to GRP systems has an impact on the usage of GRP systems by employees in Saudi Arabia.

C. DEMOGRAPHIC CHARACTERISTICS

Demographic characteristics are deemed to be moderating variables that affect individuals’ beliefs and attitudes about whether they should accept technological innovations. Fishbein and Ajzen [40] and Frambach and Schillewaert [11] noted that demographics constitute an influential factor that affects behavior. Individuals who espouse masculine values emphasize work-related goals such as earnings, advancement, competitiveness, performance and assertiveness. On the other hand, people who espouse feminine values emphasize personal goals such as a friendly atmosphere, comfortable workplace environment, quality of life and warm personal relationships [80], [85]. Opinions vary about males and females with reference to the adoption of technological innovations. Some studies found that males embrace technological innovation much more significantly than females because they think they are more skilled in computer-related tasks and more attracted to modern technology than females [86], [87].

Studies revealed that older people use technological innovations significantly less than younger people [86]. Kwok and Gao [77] conclude that younger workers are much more accepting of new technologies. In contrast, older people find it harder to embrace a new system in the organization [39], [80]. Education is one of the most important variables that can determine the adoption of technological innovations because users learn to operate and appreciate innovation at different levels [13]. The decision to employ any technological innovation is associated with the amount of knowledge a person has [88]. When an individual employee holds a senior position, they might have the responsibility to adopt an innovation. On the other hand, general employees might be under pressure to use certain innovations as directed by senior management. Not much research has been done on whether workplace positions impact innovation adoption [13].

IV. METHODS

This study is an attempt to investigate the acceptance and adoption of the GRP systems by employees at the Ministry of Foreign Affairs in Saudi Arabia. This ministry handles all foreign affairs matters on behalf of the Saudi government in addition to issuing visas and overseeing immigration-related matters. The organization has its main headquarters in Riyadh, multiple branches throughout the country and 125 embassies and consulates across the globe. The ministry has in total 4500 employees and contractors worldwide. The study will also look at the different departments within the ministry, either in Saudi Arabia or elsewhere in the world. About 20% of workers are females. The GRP systems devised for the model developed in this study have been functioning in the ministry for several years. However, it appears to be of limited usage to the employees, and it is important to find out why this is the case and how its acceptance could be improved.

The questionnaire served as the primary data collection method to test the list of religious factors that affect individual

employees' adoption of GRP. The primary procedure for obtaining data will be the online survey questionnaire. The first stage after designing the questionnaire involves obtaining experts' opinions on the questionnaire's logic, coherence, sentence structure, etc., and the study context and technical aspects. This was followed by a pilot study in which the study instruments were pre-tested to identify and modify any items that the respondents misinterpreted, skipped over, or answered improperly. The questionnaire was constructed based on a five-point Likert-type scale [89]: 1 = Strongly Agree (SA); 2 = Agree (A); 3 = Neutral (N); 4 = Disagree (DA); and 5 = Strongly Disagree (SD). The questionnaire was distributed to the Ministry of Foreign Affairs IT section, which has approximately 1700 personnel. Employees of the IT divisions within the Ministry of Foreign Affairs were chosen as they were familiar with the system and would be able to provide accurate responses to the questionnaire.

The study sought permission from the ministry and used the staff email system, inviting them to participate. The items to measure the various constructs are based on previously developed and validated measures that have been modified to suit the current study. Table 1 summarizes the definition of the construct and variables that will be measured. The questionnaire was sent to 1700 employees, and after two reminders, a total of 382 completed questionnaires were received, of which 42 were unusable due to incomplete answers. This represented a response rate of 22.48%. According to Shamsuddoha [90] this response rate is considered sufficient as the response rate for any organizational study in a developing country context is relatively low and a 20% response rate could be optimistic. There are several reasons for this low response rate. First, participation in the survey was voluntary and there were no incentives involved in completing it. Second, public service employees in Middle Eastern countries are not familiar with much of the research activity and so, generally they not willing to complete the survey questionnaire [91]. Multivariate statistical analysis was undertaken to test the research model. A number of related statistical tests were also conducted: summary statistics, correlation analysis, reliability and validity analysis, factor analysis and multiple regression analysis.

V. DATA ANALYSIS

A. DEMOGRAPHIC INFORMATION ABOUT THE RESPONDENTS

This section examines descriptive statistics concerning the people who agreed to take part in the study. The demographic profiles constitute an important source of information about individual employees' decisions to adopt GRP systems. Demographic information shows respondents' gender, age, academic qualification and workplace position. Results found that men constitute 85.3%, while women represent 14.7% of the respondent cohort. In the Ministry of Foreign Affairs, only about 20% of its workforce are female. Thirteen per cent of them belong to the 20 to 30-year age group and 52.9% to the 30 to 39-year age group, while 24.4% are in

the 40-49 age group and 10.3% are 50 or more. This finding means that most employees are in what could be termed the 'young-middle age' group who are generally more inclined to embrace technological innovations.

The results reveal that 2.9% of the respondents are high school degree holders, and 12.6% hold a graduate diploma. 54% of participants have a bachelor's degree, whereas 26.8% have a Master's degree. Only 3.5% of them have a PhD qualification. Twenty-two per cent of the respondents are managers, and 31.8% are general administrators. Furthermore, 20.6% are technicians, 15% are contractors, and 10.9% are diplomats. These results inform us that most of our respondents are male, middle-aged, hold moderate to high educational qualifications and work as office administration staff. Goodness-of-fit Chi-square tests confirm that the sample represents the research population regarding gender, age, academic qualification and job position.

B. CONSTRUCT VALIDITY AND RELIABILITY

The validity of the study instruments was measured using convergent and discriminant validity analysis. Convergent validity highlights the extent to which study items are thought to reflect a specific measurement construct [92]. Results of factor loading show that the factor loading ranges between 0.646 and 0.938, which indicates that items are loaded within the defined construct. This result proves that factor loadings are adequate, and they provide evidence of constructs' convergent validity. Conversely, discriminant validity is sufficient when the constructs' AVE (average variance extracted) is higher than 0.50, which demonstrates that at least 50% of the measurement variance is captured by the constructs [93]. The analysis reveals that AVE score ranges from 0.689 to 0.860, which is greater than the recommended score of 0.50.

Hence, we can say that the study instruments have achieved an acceptable level of discriminant validity [93]. Bagozzi and Yi [94] stated that AVE should be above at least 0.5. Meanwhile, Fornell and Larcker [95] stated that an AVE in excess of 0.5 generally signifies appropriate convergent validity. To measure reliability in terms of internal consistency, the study used Cronbach's alpha coefficient. This type of alpha value is used to examine the internal research consistency of measuring [92], [96], [97]. Internal consistency shows the degree to which responses are consistent across all the items within the measurement scale [98]. Hair *et al.* [99] and Pallant [100] stated that construct reliability should be 0.70 or higher to indicate adequate convergent reliability or internal consistency.

Table 2 shows the reliability coefficient (Cronbach's alpha) for independent and dependent variables of this study. Results show that Cronbach's alpha values are greater than 0.70 for most of the constructs, and the higher reliability range suggests the collected data maintains a high internal consistency. Reliability values between .70 and .80 are considered "respectable" whereas reliability values between .80 and .90 are considered "very good" [108]. Results show that alpha

TABLE 1. Definitions of the constructs and measures of the variables.

Factor	Definition	Items	Sources
Perfection (Itqan)	Itqan is the Arabic word for perfectionism. It is considered to be an Islamic work value. Itqan (perfection) here means the attitude of being careful, hardworking, meticulous and excellent in carrying out and accomplishing tasks. The concept of itqan (perfectionism) emphasizes quality rather than quantity. Working with Itqan (perfectionism) includes being well-organized in performing the task and efficient in timing, which means not being too hasty or tedious, but it has to be done in effective ways and produce great accuracy [25].	-I would work on my assigned task with a systematic and well-organized plan. -Knowing that I am competent, I still want to always try to improve myself. -I do not like to see my work as reflecting average performance. -I always think of ways to improve my own performance. -I enjoy learning new skills that help me cope with changing work demands.	The items have been selected and modified from the study by Ab. Wahab, Quazi and Blackman [25].
Cooperation (Ta'awun)	The Arabic word for cooperation is "ta'awun" which means working together with somebody else to achieve something [25]. Cooperation was defined by Endot [101] as an act of helping others in difficulties, enjoining good and forbidding wrongdoing, working collectively and seeking advice or ideas concerning a difficult task. In Islam, cooperation should be in doing good things that benefit other people and should not be in doing evil that could harm others. Cooperation is very important in institutions because it makes the task easier and helps get the job done [25].	-I always try to help others. -I always cooperate well with my colleagues at work. -I am willing to sacrifice my personal interests for the benefit of my coworkers. -Cooperation is a virtue in work. -I enjoy working with others more than working alone.	For the purpose of this study, items have been taken from the study by Ab. Wahab, Quazi and Blackman [25] and Endot [101] to measure the Islamic value (cooperation).
Responsibility (Mas'uliyah)	Mas'uliyah is an Arabic term meaning responsibility. Thus, Mas'uliyah is a state of being asked to be responsible. Specifically, Mas'uliyah is based on the concept of trust, equity, balance and fairness, benevolence and excellence. In Islamic management, accountability has two dimensions: the first is to feel responsible to God after leaving this world (life after death); and the second is that the worker is accountable to his immediate boss to whom he has to report. In Islam, everyone is ultimately accountable to God and this accountability encompasses one's accountability to society [102].	-I am aware that my employer relies on me to do my job to the best of my ability. -I work hard because that is what every employee is expected to do. -I do my work best in accordance with my responsibility as an employee. -I feel guilty if I do not do my job as entrusted to me by my employer. -I perform my job efficiently as I always feel accountable to God.	For the purpose of this research the following statements have been selected and modified from the study by Ab. Wahab, Quazi and Blackman [25] to measure the Islamic value (responsibility).
Transparency (Shaffaf)	Transparency means to put things into writing and full disclosure [25]. When applying the concept of transparency, employees should disclose information regarding the strategy, actions, contribution to the community and the use of resources [103]. Transparency, as an Islamic value, is mentioned in the holy Quran in the verse: "O ye who believe, when you deal with each other, in transactions involving future obligations in a fixed period of time, reduce them to writing. Let a scribe write down faithfully as between the parties: let not the scribe refuse to write: As Allah has taught him, so let Him write" (Baqarah 282).	-It is important for me to put my work-related transactions into writing. -It is necessary to provide clear information about a company's products/services. -Those who state things honestly will not harm others. -When asked, I will inform about the advantages and disadvantages of products/services. -I only follow the rules if they are compatible with ethics. -It is never appropriate to conceal faults in a product or good/service.	The items are modified from the study by Ab. Wahab, Quazi and Blackman [25] to measure the Islamic value (transparency).
Attitude	Attitude refers to a person's feelings (evaluative affect) about performing a behavior [104]. Attitude has been defined as "an individual's positive or negative evaluation of performing the behavior. Attitude refers to the person's judgment that performing the behavior is good or bad, that he is in favor of or against performing the behavior" [40].	-Using the GRP application is important to my job. -Using the GRP application is relevant to my job. -Using the GRP application is helpful. -Using the GRP application is practical. -I like the idea of using the GRP application.	These five items were used in the study taken from Talukder [13], Al-Gahtani and King [41], Taylor and Todd [105] and Lam, Cho and Qu [78].
System usage	The usage of an innovation system is considered as a good indicator as an operationalized self-reported measure of actual adoption. To measure a system usage five indicators found in other studies were selected by the researcher. These five indicators are: actual amount of time spent, frequency of use, usage level, number of features used, and sophistication level of features used.	-Respondents were asked how much time they spend using GRP systems. -Respondents were asked about how frequently they use the GRP systems. -Respondents were asked about the usage level of different features of GRP. -Respondents were asked about the number of features used. -Respondents were asked about the sophistication level of the features used.	Items were taken from the studies done by Al-Gahtani and King [41], Igbaria, et al. [106], and Igbaria, et al. [107].

values are reliable and demonstrate appropriate construct reliability of the study instruments.

C. CORRELATIONS OF THE STUDY VARIABLES

Correlation analysis explains the evidence of relationships between the study variables, which can then be used for further investigation, analysis, and hypothesis testing. Table 3 shows Pearson's correlation analysis. Results show that attitude to GRP systems adoption is positively and significantly related to all four independent religious factors: transparency ($r=.402, p<.001$), responsibility ($r=.388, p<.001$), perfection ($r=.449, p<.001$) and cooperation ($r=.436, p<.001$). Findings indicate that attitude to GRP systems adoption is also significantly and positively related to systems usage ($r=.878, p<.001$). It is evident that Pearson's correlation among study variables ranges from $r=.155$ to $r=.878$ ($p<.001$), meaning that no multicollinearity problem exists among the selected variables. According to Hair, Black, Babin, Anderson, and Tatham [99], the simplest and most obvious means of identifying collinearity is to examine the correlation matrix. The presence of high correlations, which is generally 0.90 and above, is an indication of substantial collinearity.

D. EVALUATING THE THEORETICAL RESEARCH MODEL

The theoretical research model represents the foundations for a theory and especially the path model. Data analysis

determines how well the empirical data support the theoretical framework developed in this research and whether the theory can explain the phenomenon. The conceptual research model is further examined after confirming the reliability and validity of the measurement construct as well as the initial results of the correlation analysis. The multivariate regression analysis has been used to determine the structural model relationships that also represent the hypothesized relationships among the study variables.

The sample is regarded as adequate with the regression analysis specified in terms of dependent and independent variables, and the assumptions for the individual variables are met. An estimate of the regression model and an assessment of the overall model fit were then done. The results reveal that correlation coefficient r-square ($R^2 = .372$) - also known as the coefficient of determination - indicates the percentage of the total variance of the dependent variable that is explained by the independent variables. In this analysis, 37% of the variance of employees' attitudes to the GRP application can be explained by the effect of religious values. Prior research suggests that an R^2 of .15 suggests moderate variance while an R^2 of .35 implies high variance [109]. The standard error of the estimate is another measure of the predictions' accuracy, which represents an estimate of the standard deviation of the actual dependent values around the regression line. Furthermore, the results of Durbin-Watson statistics inform us there is no problem regarding autocorrelation. As a rule of thumb,

TABLE 2. Factor loading, reliability and convergent validity.

Factor	Factor loading	Cronbach's α value	AVE
Perfection		.849	0.790
Perfection1	.647		
Perfection2	.795		
Perfection3	.830		
Perfection4	.872		
Perfection5	.791		
Cooperation		.804	0.758
Cooperation1	.824		
Cooperation2	.804		
Cooperation3	.670		
Cooperation4	.791		
Cooperation5	.686		
Responsibility		.779	0.735
Responsibility1	.646		
Responsibility2	.749		
Responsibility3	.813		
Responsibility4	.708		
Responsibility5	.746		
Transparency		.722	0.689
Transparency1	.686		
Transparency2	.703		
Transparency3	.723		
Transparency4	.683		
Transparency5	.648		
Attitude towards GRP systems		.878	0.821
Attitude1	.852		
Attitude2	.817		
Attitude3	.833		
Attitude4	.785		
Attitude5	.815		
Usage of GRP systems		.927	0.860
Time used	.849		
Frequency of usage	.938		
Features of usage	.803		
Level of usage	.893		
Number of features used	.836		
Usage of sophisticated elements	.834		

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

TABLE 3. Inter-correlations among study variables.

Variables	1	2	3	4	5	6
1. TRA	1	.443 a	.155 a	.385 a	.402 a	.366 a
2. RES	.443 a	1	.227 a	.605 a	.388 a	.362 a
3. PER	.155 a	.227 a	1	.234 a	.449 a	.315 a
4. COO	.385 a	.605 a	.234 a	1	.436 a	.357 a
5. ATT	.402 a	.388 a	.449 a	.436 a	1	.878 a
6. USA	.366 a	.362 a	.315 a	.357 a	.878 a	1

TRA=Transparency, RES=Responsibility, PER=Perfection, COO=Cooperation, ATT=Attitude, USA=Usage level; a Correlation is significant at the .001 level

values of less than 1 or greater than 3 are definitely a cause for concern [96]. For this study's data, the value is 1.993, so the assumption has been met.

Table 4 indicates the B-values (Unstandardized coefficient) and constant for regression equation and significance level of each independent variable. Unstandardized coefficient B values indicate the individual contribution of each

TABLE 4. Regression model for GRP systems.

Independent Variables	Unstandardized Coefficients (B)	Standardized Coefficients β	t	Sig.
(Constant)	4.220E-17		.000	1.000
Perfection (Itqan)	.344	.344	7.678	.000
Cooperation (Ta'awun)	.222	.222	4.007	.000
Responsibility (Mas'uliyah)	.073	.073	1.284	.200
Transparency (Shaffaf)	.230	.230	4.700	.000

Dependent Variable: Attitude

TABLE 5. Regression model for GRP systems usage behavior.

Variables	Unstandardized Coefficient B	Standardized Coefficient β	t	R Square	Sig.
Constant	1.863E-16	0.026	0.000	0.770	0.000
Attitude to GRP systems	0.878	0.026	33.645		0.000

Dependent Variable: Usage

TABLE 6. Regression model for GRP systems (direct relationship with usage behavior).

Independent Variables	Unstandardized Coefficients (B)	Standardized Coefficients β	t	Sig.
(Constant)	1.794E-16		.000	1.000
Perfection (Itqan)	.218	.218	4.435	.000
Cooperation (Ta'awun)	.145	.145	2.386	.018
Responsibility (Mas'uliyah)	.127	.127	2.030	.043
Transparency (Shaffaf)	.221	.221	4.112	.000

Dependent Variable: Usage

predictor to the model. The table also shows the t values for all of the path coefficients and whether they are significant or non-significant. The analysis confirms that the relationship between transparency and attitude is significant, with a t value of 4.00 (>1.65). Perfection demonstrates a strong significant relationship with attitude with a t value of 7.678 (>1.65), and cooperation is significant with a t value of 4.007 (>1.65). In addition to checking the t value, the study analyzed p-value, which should be within the range of $p < 0.001$, $p < 0.005$ and $p < 0.10$ for it to be considered significant and acceptable. Any value higher than 0.10 will be considered as non-significant. Table 5 shows that perfection ($t=7.678$, $p < 0.000$), cooperation ($t=4.007$, $p < 0.000$) and transparency ($t=4.00$, $p < 0.000$) are significantly related to attitude to using GRP systems. The factor of responsibility ($t=1.284$, $p < 0.200$) is not statistically significant.

The study also analyzed the relationship between attitude as an independent variable and GRP systems used as the dependent variable. Results are presented in Table 5, which shows that the effect of attitude regarding usage shows that

TABLE 7. Moderation effect.

Dep Variable	Primary Predictor Variable	Moderating Variable	Primary Predictor and Moderator Product Variable	Standardized Coefficients β		t-Value	Sig (p)	F- Value
Attitudes to GRP Systems Adoption	Perfection (Itqan)	Gender	Perfection*Gender	Perfection	-.355	-1.727	.085	1.911 (.128)
				Gender	.033	.591	.555	
				Perfection*Gender	.262	1.269	.205	
	Perfection (Itqan)	Age	Perfection*Age	Perfection	-.445	-1.934	.054	2.686* (.047)
				Age	.104	1.833	.068	
				Perfection *Age	.371	1.592	.112	
	Perfection (Itqan)	Academic Qualification	Perfection *Qualification	Perfection	-.321	-1.841	.067	1.970 (.118)
				Qualification	.053	.977	.329	
				Perfection *Qualification	.231	1.326	.186	
	Perfection (Itqan)	Job Position	Perfection *Position	Perfection	-.106	-.782	.435	1.191 (.313)
				Position	.023	.424	.672	
				Perfection *Position	.007	.055	.956	
	Cooperation (Ta'awun)	Gender	Cooperation *Gender	Cooperation	.483	2.691	.007	16.024** (.000)
				Gender	.034	.673	.501	
				Cooperation *Gender	-.139	-.774	.440	
	Cooperation (Ta'awun)	Age	Cooperation *Age	Cooperation	.234	.971	.332	16.822** (.000)
				Age	.089	1.738	.083	
				Cooperation*Age	.117	.486	.627	
	Cooperation (Ta'awun)	Academic Qualification	Cooperation *Qualification	Cooperation	.769	3.643	.000	17.338** (.000)
				Qualification	.032	.638	.524	
				Cooperation *Qualification	-.434	-2.052	.041	
	Cooperation (Ta'awun)	Job Position	Cooperation *Position	Cooperation	.259	2.059	.040	16.349** (.000)
				Position	.058	1.130	.259	
				Cooperation *Position	.105	.835	.404	
	Responsibility (Mas'uliyah)	Gender	Responsibility *Gender	Responsibility	.589	3.432	.001	16.479** (.000)
				Gender	.045	.878	.381	
				Responsibility *Gender	-.252	-1.467	.143	
	Responsibility (Mas'uliyah)	Age	Responsibility *Age	Responsibility	.082	.343	.732	16.649** (.000)
				Age	.074	1.444	.150	
				Responsibility *Age	.268	1.124	.262	
	Responsibility (Mas'uliyah)	Academic Qualification	Responsibility *Qualification	Responsibility	.557	2.750	.006	15.797** (.000)
				Qualification	.024	.458	.647	
				Responsibility *Qualification	-.219	-1.080	.281	
	Responsibility (Masuliyah)	Job Position	Responsibility *Position	Responsibility	.343	2.743	.006	15.469** (.000)
				Position	.034	.666	.506	
				Responsibility *Position	.004	.035	.972	
	Transparency (Shaffaf)	Gender	Transparency *Gender	Transparency	.310	1.696	.091	7.724** (.000)
				Gender	.049	.922	.357	
				Transparency *Gender	-.062	-.340	.734	
	Transparency (Shaffaf)	Age	Transparency *Age	Transparency	.144	.547	.585	8.355** (.000)
				Age	.086	1.636	.103	
				Transparency *Age	.104	.395	.693	
	Transparency (Shaffaf)	Academic Qualification	Transparency *Qualification	Transparency	.286	1.325	.186	7.520** (.000)
				Qualification	.034	.652	.515	
				Transparency *Qualification	-.040	-.187	.852	
	Transparency (Shaffaf)	Job Position	Transparency *Position	Transparency	.286	2.320	.021	7.723** (.000)
				Position	.051	.961	.337	
				Transparency *Position	-.037	-.296	.768	

the correlation coefficient squared ($R^2 = .770$) is the coefficient of determination. In this analysis, 77% of the variation of employees' use of the GRP application can be explained by the effect of attitude. It emerges that attitude to the system is a predictor of system usage. Table 4 above shows the results for the correlation coefficient and the fact that there is a highly significant relationship between the dependent variable (usage) and the independent variable (attitude). The level of significance is 0.000.

This finding agrees with the Theory of Reasoned Action [40], [110], which assumes the full mediating role of attitude on behavioral intention. This outcome is slightly different from studies conducted using the technology acceptance

model [8], [79]. They argue for a partial or minimal mediating role of attitude on behavioral intention, and this finding is consistent with Kim and Garrison [93]. These scholars found that attitude to using the system is the most important determinant of behavioral intention.

A further analysis has been conducted to understand the direct relationship between the independent variables and GRP systems usage, and the results are shown in Table 6. The findings show that the direct relationship between the independent variables and their resulting usage behavior is confirmed by explaining .247% of the variance with a significance level of $p < 0.000$. The results reveal that three religious values are significant at the 0.001 level. These are as follows:

perfection: $\beta = .218$, $t(340) = 4.435$, $p < 0.000$; cooperation: $\beta = .145$, $t(340) = 2.386$, $p < 0.018$; and transparency: $\beta = .221$, $t(340) = 4.112$, $p < 0.000$. Responsibility is significant at the 0.05 level ($\beta = .127$, $t(340) = 2.030$, $p < 0.043$). This outcome shows that religious values directly and strongly impact on employees' usage of GRP systems in Saudi workplaces.

E. IMPACT OF DEMOGRAPHICS

Analysis was conducted to discover the moderating impact of demographics (gender, age, academic qualifications and job position) between independent (perfection, cooperation responsibility and transparency) and dependent (attitude to GRP systems adoption) variables in the Ministry of Foreign Affairs. Results for the moderating effect analysis are shown in Table 7. Demographic factors analysis shows that all four factors - gender, age, academic qualification and job position - have a partial moderating impact between independent and dependent variables. Participants' age has been found to positively shape the relationship between perfection and attitude to GRP systems adoption. Findings also reveal that academic qualification significantly moderates the relationship between perfection and attitude. It is made evident by the findings that all four categories of demographic factors moderate the relationship between independent variable cooperation and dependent variables attitude to GRP systems adoption in the workplace context.

Gender and job position are two demographic features that moderate the relationship between transparency and perceptions of GRP systems adoption. Hung et al. [111] stated that gender exerts a moderating effect only on the relationship between performance expectancy and inexperienced users' behavioral intention. Similarly, gender, age, academic qualification and job position moderate the connection between responsibility and attitude to adoption. According to Talukder et al. [112], respondents' demographic characteristics such as age and education qualification did not significantly impact attitude regarding adoption and usage. However, Obisesan [113] found that gender differences impact technology adoption in Nigerian farming households. Regarding employees' job positions, Eom et al. [114] stated that it does have an impact when it comes to the issues concerning new technologies and their adoption. Therefore, demographics moderately affect the relationship between religious values and attitude to new technology.

VI. DISCUSSION, CONCLUSION, AND IMPLICATIONS

Several hypotheses were proposed to assess the impact of religious values on adopting GRP systems in Saudi Arabia. Results of the analysis of the religious value show that three factors significantly affect attitudes to adopting GRP systems applications: perfection (significance level.000), cooperation (significance level.010) and transparency (significance level.000). The fourth factor - responsibility - was not significant with attitude to GRP adoption but nonetheless has shown a moderately significant (at 0.05) relationship directly

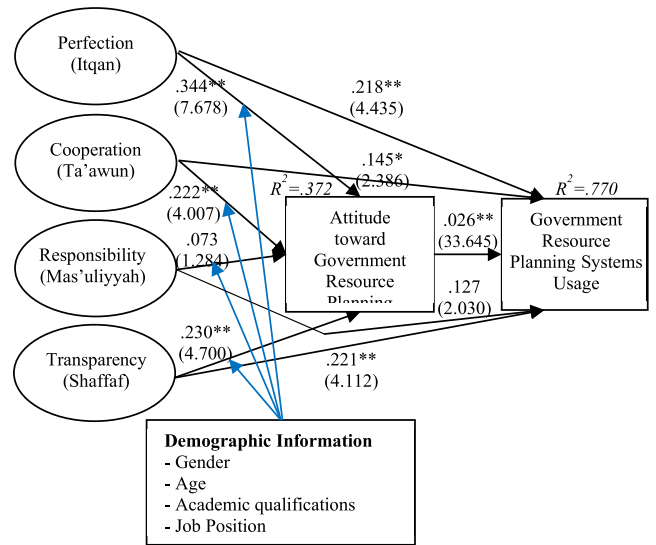


FIGURE 2. Test results of the proposed research model. Regular numbers represent standardized weight. Numbers inside the brackets represent critical values. Italicized numbers represent variance explained. **p = .001; *p = .01.

with usage level. Therefore, hypotheses H1a and H1b, H2a and H2b, H3b; H4a and H4b are supported in the model. A summary of the results for the hypotheses testing is shown in Table 8. Barnes [115] studied the influence of religious faith on trusting beliefs in the context of technology acceptance. He stated that religious faith increases benevolence, which in turn influences perceived ease of use, perceived usefulness and behavioral intention. Sun et al. [116] concluded that religious affiliation and commitment were both effective segmentation strategies since differences in adoption intention were evident between Muslims and non-Muslims and devout and casually religious Muslims. Overall, devout Muslims were socially oriented with their adoption criteria, whereas casually religious Muslims and non-Muslims had more utilitarian attributes.

Mashlah [47] described perfection (Itqan), which in Islam refers to the act of worshipping. Other literature defined the term Itqan as an Arabic word for perfectionism [25]. Literally, it means arranging and disposing of things scientifically and logically to get the perfect outcome. The author explained this word as the attitude of being careful, meticulous, hard-working and excellent in carrying out responsibilities and tasks. The author considered efficiency, clear objectives, and an effective working style as evidence of the desire for Itqan (perfection). According to Farg, Khalil, and Salih [63], perfection is connected to the concept known as Total Quality Management (TQM). Perfection (Itqan), according to Mashlah [47], will increase the need for innovation and creativity as a result of striving for perfection so that individuals and the community benefit. Technology enables employees to improve their workplace performance and accuracy, thus minimizing errors. Again, referring to Mashlah [47], Itqan increases the need for innovation and creativity as a result of striving for perfection. This leads us to assume that perfection

TABLE 8. Summary of the results.

Hypotheses	Path Direction	St. Estimate	CR	P	Result
H _{1a}	PER → ATT	.344	7.678	0.000**	Supported
H _{1b}	PER → USA	.218	4.435	0.001**	Supported
H _{2a}	COO → ATT	.222	4.007	0.000**	Supported
H _{2b}	COO → USA	.145	2.386	0.018*	Supported
H _{3a}	RES → ATT	.073	1.284	0.200	Not Supported
H _{3b}	RES → USA	.127	2.030	0.043	Moderately Supported
H _{4a}	TRA → ATT	.230	4.700	0.000**	Supported
H _{4b}	TRA → USA	.221	4.112	0.000**	Supported
H ₅	ATT → USA	.878	33.645	0.000**	Supported

Legend: PER= Perfection, COO= Cooperation, RES=Responsibility, TRA=Transparency, ATT= Attitude, USA=Usage
 Results significant at: **p = .001; *p=.01
 Model fit: R² for attitude=.372; R² for usage=.770

is an important factor that affects the acceptance and adoption of new technological innovations.

The effect of attitude on GRP application usage is a high significance level of .000, which means H₅ is supported. This finding agrees with the theory of reasoned action [40], [110] that assumes attitude has a mediating role on behavioral intention and usage. A few studies’ results do slightly differ from those employing the technology acceptance model [8], [117], which argue for a partial or minimal mediating role of attitude on behavioral intention. The finding does agree with that of Kim and Garrison [93], who reported that attitude to accessing the system is the most important determinant of behavioral intention. In his recent study, Hussein [118] concluded that attitude was a significant predictor of students’ intention to use e-learning systems.

This research responds to the call for a more in-depth understanding of the religious factors on how individuals adopt innovation and the factors that influence employees’ embracing of innovation. To increase the adoption rate of innovation in the workplace, managers must recognize the religious factors that influence individual employees’ perceptions of technology adoption. Acceptance of technological innovations helps to reduce commuting time, improves the quality of work and enhances workplace productivity [114]. It is essential to understand the determinants of technology adoption because these outcomes will not be realized if the technologies are not used effectively [114]. This research develops a conceptual model that seeks to explain the impact of religious factors on the attitude toward the adoption of the GRP systems in Saudi Arabia.

The GRP systems have emerged as an on- and off-the-shelf tool for optimizing business processes since its introduction into Saudi Arabia. The system enhances interdepartmental collaboration and communication necessity and scope. It helps businesses achieve their goals to increase communication, work productivity, and accessibility for all stakeholders [119]. Four variables were selected from the demographic category: gender, age, academic qualification, and job position. Only one variable (age) emerged as having a moderating effect on the attitude to adopting the GRP systems, while the remaining three variables had no significant effect on this aspect of technological adoption. Four religious

factors were tested, and three of them - perfection, cooperation and transparency - were found to have a significant effect on attitude to the adoption of technological innovations, while responsibility had no significant effect on the attitude to the adoption of the GRP systems.

The research on the drivers of individual employees’ adoption of technological innovation is still very limited in the Middle East and especially Saudi Arabia. Only a few studies have been conducted on the determinants of technological innovation in this part of the world. Although many studies have looked at this topic in the developed countries, only a few have been done on the developing countries such as the Middle East with reference to the GRP systems. This study addresses a significant research deficiency in the literature by examining the effects of religious factors on the adoption of the GRP systems in Saudi Arabia. It was timely to examine the factors that influence the adoption of technological innovations by individuals in a specific organizational context to explain what these factors do for public service personnel.

The study confirmed the significant role of religious factors which affect the acceptance and use of GRP systems in a Saudi government institution. The study succeeded in validating the proposed research model and the supporting relationships among the key constructs in this context. This study has theoretically contributed to the topic by proposing an updated conceptual model of technology adoption with reference to the impact of religious factors on GRP systems adoption in Saudi Arabia. The conceptual model developed for this thesis provides a new approach that will provide a better understanding and advance research in the field of innovation acceptance. It does this by adding new variables to suit the religious values of the study population in a Middle East country that is also a developing market economy – Saudi Arabia.

One of the major contributions lies in combining different theories developed in Western countries to study the process of adoption and use of technological innovation. The applicability of some research theories and models to developing countries has been questioned because of the differences in social, traditional cultural and religious factors, for example, those between Western and Middle Eastern countries. This research succeeded in making use of these theories to develop a conceptual model that can test the acceptance and adoption of technological innovations in one developing country that is very different from Western countries. Furthermore, this study has contributed to new knowledge by researching an area that has till now not been much explored. The study adds knowledge on how religious factors affect individuals’ perceptions of technology adoption in the Middle East. This may act as a future source of reference for studies contemplating the subject of technology acceptance in Arab countries. The study will provide a good understanding of the factors that influence and determine organizations’ employees’ adoption of the GRP systems. It contributes to knowledge by providing a deep understanding of the religious factors affecting the acceptance and use of technological innovations in public

sector organizations in Saudi Arabia. Religious factors in technology adoption research are rarely taken into account. This study fills that gap in our knowledge on this subject.

A. IMPLICATIONS OF THE STUDY

This study has implications for management personnel, government officials and other public sector organizations. These are explained in more detail below.

1) IMPLICATIONS FOR MANAGEMENT PERSONNEL

This study has important implications for management personnel working for public sector organizations in the Middle East countries in general and Saudi Arabia specifically. The results will help managers consider the factors influencing the effective adoption and usage of technological innovations in the workplace more carefully. The inference drawn from the results will encourage managers to take effective decisions and devise policies regarding the efficient usage and implementation of technological innovation such as GRP systems. It is evident that religious factors are important in employees forming positive attitudes to technological innovation in Middle East organizations and workplaces. Managers may encourage the creation of professional and social clubs and organize seminars and formal or informal discussion groups that communicate and emphasize religious values. They do this in terms of the development of professionalism, cooperation, and support when issues arise with new technology adoption and usage.

Managers must consider the importance of the relevant religious factors in adopting and using technological innovations to help reduce the related costs and act fast for new technologies to take hold. For example, management can appeal to employees' religious values by linking the use of technology to their sense of duty, responsibility and commitment to help others in the workplace. A country such as Saudi Arabia is one where religious value are observed strictly, which can help management implement new technology acceptance and continuous usage for the organization's benefit. Religious values will motivate employees to adopt and use technological innovation as long as the technology does not pose any threat to the value perceptions and are relevant to the workplace. Managers will have to be vigilant regarding the identification of any problems that individual employees may encounter in adopting innovation, including the need to improve employees' skills, expertise and familiarity with computer-driven systems.

2) IMPLICATIONS FOR THE GOVERNMENT

The findings of this study have important implications for the government and policymakers to implement technological innovation within public sector organizations. An effective technology usage policy is essential in order to create a functional and professional working environment based on a transparent, distinguished and flexible public service so that administrative work responsibilities can be expedited properly and efficiently. The government needs to facilitate and

provide a conducive environment for internal and external users of the technology. The government needs to understand the importance of religious factors that motivate individual employees to use the new technology.

Policymakers need to communicate and motivate the employees to enhance their feelings and responsibilities to use the technology for greater benefits and well-being of the relevant stakeholders and the wider society. Government can enhance the level of usage of new technology by encouraging and inspiring individual employees for greater cooperation, supporting each other, and assisting colleagues when technological innovation is required.

Currently, Middle Eastern countries have relatively low innovation adoption practices due to their general conservatism, which is mainly driven by their traditions, cultures and religious assumptions in integrating new technology systems into the workplace. The government can enhance technology adoption by encouraging employees to follow religious instructions such as doing things with perfection in mind, cooperating with others in adopting new technology, taking responsibility and creating transparency in the work they do for various stakeholders. These strategies can better implement innovation that ultimately will improve cost effectiveness, organizational workplace efficiency, better service quality, and productivity in public sector organizations.

3) IMPLICATIONS FOR ORGANIZATIONS

Organizations throughout the world have been continually adjusting to rapidly changing technologies and circumstances in their operations and service departments. Therefore, it is important to monitor the driving forces shaping the innovation adoption process continuously, especially in a country like Saudi Arabia. In Middle Eastern countries, religious values significantly impact individual employees' mindset to get things done, emphasizing supporting each other, responsibility, and caring for others. Organizations will benefit from this research in developing policies for adopting and using the GRP systems in the workplace context, particularly in public sector agencies. The extent to which technological innovations can be used to support organizational needs and improve the work environment is an important issue. It is evident that adopting the GRP systems creates many positive benefits for organizations in general and Saudi government organizations. It reduces operational costs, saves time and increases the quality of services being delivered to their customers. Furthermore, when systems are implemented to get the right outcomes, they can reduce related costs and enable faster and more efficient individual uptake of innovation in the organization, such as less need for training sessions, which are themselves time- and budget-consuming. This study emphasizes that workplaces need to consider employees' religious orientation and facilitate a positive environment.

VII. LIMITATION AND FUTURE RESEARCH

Like any other research, this study does have its limitations. One is that the study was conducted in a public sector

organization and did not compare the results with private sector organizations, which could enrich the findings of this research. Therefore, the future study of this topic should be extended to other areas such as the private sector or services sector organizations to broaden our understanding of the adoption of GRP systems in the Middle East. The study encompasses a single institution - the Ministry of Foreign Affairs in Saudi Arabia. The same research conducted in another setting might generate different results since cultural, social, and religious factors could vary according to situational contexts.

Since the data were collected from one organization, the findings may not be generalizable to other institutions or countries with different environmental settings and factors. Due to practical constraints, all measurements were taken at a single point in time. A study done at various times might reveal different results. Longitudinal studies are needed to fully investigate the causal effects of factors and their relationships and how these changes. A longitudinal study undertaken by future researchers would better interpret the factors investigated here and the impact of interventions on behavioral attitudes.

The study has focused on a specific technological innovation which is the GRP systems. Studies could concentrate on other advanced technologies to provide greater insights into the changing face of technology adoption in workplace settings and how GRP systems compare to other technologies. There has been none or very few studies on the impact of religious values on technology adoption. For this reason, it was critical to develop the propositions and the study used similar or related studies in terms of social values to make connections and predictions in the hypotheses development.

However, there is a practical limitation and that concerns the unethical implication of using technology. Due to COVID-19 the world has become more open - in the sense of communication (global village/Gutenberg galaxy) and internationalization (trans-border flow of data). This paradigm shift triggers new ethical problems mainly related to the right to access to information, which means that the right to privacy is threatened by the emphasis on the free flow of information and the protection of the economic interests of owners of intellectual property. The challenges of these ethical problems pose the following consequences. Firstly, there are the consequences on a personal and social level - for example, breaching privacy, financial loss, declining trust and confidence, depression, misuse of wealth and assets, misguidance and moral degradation, etc. Secondly, there are consequences in business and corporate level - for example, financial polarization, social unrest, black market (i.e., Dark Web), loss of capital and market syndicate, copyright violations, etc. Thirdly, there are consequences at the national and global level - for example, drug smuggling and contraband trading, child abuse, illegal goods trafficking, hacking secure and sensitive computer systems, etc.

Furthermore, due to time constraints, this study did not employ a qualitative research approach. In order to further test

the model, the researcher could use the qualitative approach to generate deeper insights into innovation adaptation and usage level by public sector employees. The qualitative nature of information could enrich our understanding of the factors affecting the adoption of technological innovation. This study was conducted in only one country, Saudi Arabia. A cross-cultural study on the topic is needed to understand the perceptual differences and unique idiosyncratic factors that characterize the countries of the Middle East, including the United Arab Emirates, Kuwait, Bahrain, and Oman; these would make an interesting point of comparison.

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