Factors influencing customers' attitude to adopt e-government mobile applications

Saeed Mohamed Khatir Zahid Alhammadi[a] and Muhammad Turki Alshurideh[a,b*]

[a]Department of Management, College of Business Administration, University of Sharjah, Sharjah 27272, United Arab Emirates
[b]Department of Marketing, School of Business, The University of Jordan, Amman, Jordan

CHRONICLE	ABSTRACT
	Establishing new relations with new customers and managing customers' relations with the existing ones is important and considered challenges for each firm nowadays. Thus, studying and understanding different psychological factors like consumers' emotions and happiness, motivates and attitudes are important while it helps in how to do more business with customers and push them to stay longer especially when adopting e-government mobile applications. This study used a quantitative research approach with survey data collection from different users of government mobile applications (GMA). The sample is around 340 from different backgrounds and levels of using different government services mobile apps. The results revealed the standardized regression and coefficients interpret the direct association between the study variables, hence confirmed the hypothesized model that included several factors such as perceived usefulness, perceived ease of use, perceived skills readiness, and perceived security toward attitudes to GMA and use of GMA effects on customer happiness and positive emotion. Moreover, the conclusion and implications confirmed the literature of this research field and elucidated most of the stated factors that significantly influence the customers' emotion and happiness. For further study, research directions are given to expand the extant understanding of new different factors with other outcomes of mobile applications use.

1. Introduction

The emergence of the electronic society has coincided with the spread of the use of information and communication technology such as mobile applications, computers, and more recently the Internet. The development of society has become largely dependent on the production and distribution of knowledge, which is considered the driving force and main engine for advancement and prosperity in the age of knowledge and information (Min et al., 2021). In addition to the primary resources that decrease their use, the value of knowledge and the role of information and communication technology in transforming the nature of society from a traditional society to an electronic society in which information and knowledge flow easily and at the lowest cost (Tamilmani et al., 2018). In light of rapid technological developments, the contemporary world has realized the importance of building a society in which information and knowledge are considered a fundamental force in various areas of life, which contributes to the spread of electronic information awareness and the transition to an electronic society (Zhu et al., 2017). Todays' customers have realized the importance of change and keeping pace with modern technological developments in order to achieve progress and try to reduce the digital gap (Han et al., 2010). Accordingly, the government has made many efforts aimed to build an electronic society and establish e-government, by adopting the use of information and communication technology in various sectors. To enhance the use of digital technology by the government and the individual, all of these measures did not help governments rise to advanced ranks in the report submitted by the World Economic Forum, due to the weakness of its supportive environment and the presence of several challenges (Hirschtritt & Insel, 2018).

Therefore, to keep the customers happy, it should understand several important psychological factors like consumers' emotions, and happiness. And this requires tailor strategies to fulfill the various customers' needs and build lasting trust with positive branding and image (Malik et al., 2017). The customers' psychology suggests that the positive emotions can significantly impact the customers' decision-making process. The literature found that the influence of customers' mood on their decisions and they are more likely to use an application once it can make their mood positive (Rahardja et al., 2023). This could be more pronounced when the customers are happy, and the offers are positive and associated with the personal experience. However, the complex situations make the customers feel a backfire, which lead them to assess the offers unfavorably. Generally, the positive emotion is a powerful tool that could contribute to creating favorable environments for the customers.

The study gains its importance through address a new topic of the influencing factors of customers' Attitude and their use toward adopting E-government mobile applications and its influences on the customers' emotions and happiness as a new relationship that has not crystallized in the global consciousness, and the access to information, knowledge and technological progress are all considered the pillars of progress and social prosperity of the electronic applications, which is one of the strategic goals within the various contexts. The importance of this study is increased by its analysis of the factors influencing the customers' attitudes towards this issue and their influence on customers' emotions and happiness. It also aims to highlight the requirements that must be considered to enhance customers' attitudes considering the various changes imposed by the environments. On other hand, the present study seeks to know the challenges and requirements of adopting government mobile applications by showing the effects on customers' positive emotion and happiness and the efforts considered to keep pace with the rapid changes in the digital technology and providing the environmental requirements that support customers' positive emotion and happiness, especially since the witnesses in the recent years and the tangible progress in the field of use and employment ultimately support the modern technology in many various transactions and mechanisms for providing public services to people.

2. Literature review & hypotheses development

Mobile applications facilitate the customers in all various spheres of their life starting from searching about key information in order to make their purchasing decisions. Today's customers largely use smartphones that enable them to download many needed applications on their mobile and use them for important information searching for different pursues such as shopping, social networks, public services, banking, and others (Okoroji et al., 2021). Both customers and this industry experience the modern revolution of technology. Government agencies are currently increasing the adoption of people's orientation toward using the potential methods and ways to be connected all time with the customers (Vvan den Berg & Van der Lingen, 2019). Customer attitudes toward using the advanced mobile application have become more aware since they can reach anywhere, they want through a one click although some technical and skills related barriers and challenges (Altuwaijri & Ferrario, 2022). Similarly, the adoption of mobile applications has expanded the customer attitudes toward achieving farther aims like positive emotions and happiness. And this leads to more concern during developing these applications to fulfil customers' interests.

The applications markets are flooded hence the customers have a wide variety among the available applications at various stores and platforms that can easily be accessed by the customers on the mobile (Tarhini et al., 2019). The literature argued the benefits of the internet connectivity cultivate the different mobile applications e.g. government that lead to complexity among customers' minds and this can enhance the intention towards mobile applications (Gera et al., 2020). For example, the most popular search engine Google reported about 25% of the installed mobile applications are not used by the customers and 26% of these applications have become abandoned after a single use. Furthermore, app retention has become a concern in application marketing rather than acquisition since most apps (80%) churn within a few months (Zhao et al., 2018). So that, the app's mobile engagement is seen as an essential issue for the marketers, and they proliferate in both developing and developed markets and the customers are growing to use apps for several needs and aims e.g. entertainment, shopping, social networks, etc. In the context of government mobile apps, the business intelligence apps motivate the customer attitudes toward enlarging the available apps, and the evidence reported the mobile apps markets still in the early stage with no maturity (Gharaibeh et al., 2018). The findings showed that about 30% of the penetration rate of apps market provides outstanding opportunities and contribute to large growth in this market in the coming years (Malik et al., 2019). Thus, it is significant to explore mobile apps and investigate the important factors that lead to creating happy customers with positive attitudes and emotion in this issue. The studies explore some of these factors that are concerned with customer retention as well ensure a continuous use of the apps (Min et al., 2021). Jordan has become one of the fastest app mobile growth markets as the prediction of the marketers is about 75% of the population by 2025 (Almaiah & Al Mulhem, 2019). In addition, Jordan adds around 2.5 million new users in the mobile economy in the next few years, and this rapid evolving apps mobile customers requires further attention of the studies. The concept of perceived usefulness is defined as one's subjective perceptions about an ability of the technology to improve a performance and carrying out the tasks that influence a person's perceived usefulness and influence users technology acceptance (Indarsin & Ali, 2017). Also, it is seen at the degree which users believe that using a specific technology can improve the performance. In other words, the perceived usefulness refers to customers' perceptions related to the outcomes of their experiences (Lui et al., 2021). It indicates the capability of using something advantageously in the organizational setting, and the individuals generally reinforce for better performance. Customers tend to use or even not use application systems due to their belief it will help their performance better (Dewi et al., 2021). The usefulness is the perspective

of the user's subjective probability which applies a new technology from different sources to benefit personal well-being. Accordingly, the present study hypothesizes the following research hypothesis:

H₁: *Perceived usefulness has a significant positive effect on the attitude to use government mobile application GMA.*

The perceived ease of use refers to the degree which the individuals believe that using a system could be free from complicated efforts, also it is defined by the user's subjective perceptions about the effortlessness of using a system (Sharma, 2020). In other words, it indicates using a particular tool or system that is free of difficulties or complexity. The efforts are finite resources that the individuals may allocate into various activities that they are responsible for (Nangin et al., 2020). The mobile apps should be easy to use and more likely to be accepted by the users. It explains the user's perceptions regarding the amount of the required efforts that use the systems and the extent to which the users believe that using a technology has no effort (Alalwan et al., 2016). The factors of perceived ease of use has been considered from extant literature as an important factor that influence the user's acceptance and information technology behavior. Accordingly, the present study hypothesizes the following research hypothesis:

H₂: *Perceived usefulness has a significant positive effect on the use of government mobile application GMA.*

The perceived skills readiness is a related factor that has been addressed in the context of online services. The literature suggested that users' readiness to be involved within online collaborations and this identify the users' skills and capabilities to engage in the online practices in light of their technological literacy and cooperative skills (Silva et al., 2022). In addition, Handayani et al. (2021) argued that promoting users' readiness is important for successful online experience. It identified users' self-motivation, regulation, and awareness of the changing roles in the online setting as indicators of users' readiness for technological learning. Accordingly, the present study hypothesizes the following research hypothesis:

H₃: *Perceived ease of use has a significant positive effect on the attitude to use government mobile application GMA.*

The perceived security refers to the transactions that are held on the Internet and subject to the different possible security threats, and the users' trust is critical for web transactions and it is influenced by user's perceptions about information security (Widyanto et al., 2022). The threats through the context of mobile apps may be through the networks or even transactions attacks that occur through the unauthorized access to an account. The factor of the perceived security is a probability which the customers or users believe that their information is attacked, not viewed, manipulated or may be abused by unauthorized users through the processing (Chopdar et al., 2018). The consistency of this issue with users' expectations that the requirements of all processing are concerned and will fulfill. Accordingly, the present study hypothesizes the following research hypothesis:

H₄: *Perceived ease of use has a significant positive effect on the use of government mobile application GMA.*

According to the literature findings, the role of emotions within consumer behavior is a measure that refers to the likability that determines whether mobile apps can increase a positive emotion for the users (Wang, 2020). The discussion shows customers' emotional responses to the intention to use mobile apps that may impact the customers behaviors, thus the findings also revealed that the positive emotion has a significant effect on users' attitudes (Tian et al., 2021). Consequently, the customers prefer to use mobile apps to produce positive over their usage of a particular app. Therefore, the positive emotions are still under examination particularly because of the technology advancement of mobile apps. According to research, the customers are more likely to engage with positive emotional aspects, and the attitudes toward using mobile apps have some emotional content featuring the app's attributes (Abikari et al., 2022). Accordingly, the present study hypothesizes the following research hypothesis:

H₅: *Perceived skills readiness has a significant positive effect on the attitude to use government mobile application GMA.*

For all customers, the first interaction with something happens on the mobile app, so creating a mobile happiness experience is important. Current app developers turn to their development over crucial circumstances to enhance the happiness of the customers (Chaouali et al., 2020). Customers' attitudes about mobile apps are influenced by the level of happiness of the customers and their experience with a particular app. Furthermore, the different aspects that customers can interact with mobile apps enable them to decide if they achieve a good level of happiness and how they engage with them (Nguyen, 2018). But the experiences are deprioritized for app users which in fact argue the mobile customer experience is a priority for organizations, and the adopting mobile apps approach can help customers gain more happiness (Ahn, 2022). Accordingly, the present study hypothesizes the following research hypothesis:

H₆: Perceived skills readiness has a significant positive effect on the use of government mobile application GMA.

The use of smartphones in the work environment is common and often necessary and nowadays, all systems in these modern smartphones and many other devices provide a market for installing applications, also they also support the use of external applications (so-called third-party applications) (Balapour et al., 2020). Although allowing the use of these applications has several clear benefits, it is also important to consider the risks to an organization's devices and data from these applications. For example, the external software is usually installed and updated regularly, which in turn, depending on the permissions granted to it, may read and/or modify some or all of the user data on this device (Sudono et al., 2020). In some cases, these applications will also have access to enterprise-specific data and it is very difficult to know exactly what has been done with that data. Many of these apps work usefully to sync local data with cloud services, but some may handle them in insecure

ways, and others may use third-party code within the app that may involve previously unknown security risks (Wong & Mo, 2019). Accordingly, the present study hypothesizes the following research hypotheses:

H₇: *Perceived security has a significant positive effect on the attitude to use government mobile application GMA.*

H₈: *Perceived security has a significant positive effect on the use of government mobile application GMA.*

The emotions are the driving force behind most customers' decisions. According to the discussions, creating strong emotions whether positive or negative can help build a bond between the customers and their attitude which is a goal for all businesses (Sukhu et al., 2019). In addition, positive emotions are essential to the customer experience, as customers with positive emotions are more likely to reflect this in their attitudes to use an object. Humans make attitudes based on emotions, thus can understand how the positive emotions influence consumer behaviors to make better decisions (Choi, 2020). Because the customers will achieve greater success when you create a marketing strategy that takes into account consumers' emotional feelings in addition to their needs and desires, this is the approach that many brands take with the products, providing a solution to consumers' problems that raise the emotional aspect (Vulpe & Dafinoiu, 2011). Accordingly, the present study hypothesizes the following research hypothesis:

H₉: *Attitude to use GMA has a significant positive effect on customers' positive emotion.*

With the different services provided by the mobile apps, the customers can easily find the right target service they look for. Mobile apps let them analyze the data with easy-to-understand graphs and can also export data in different types of files to share with the team. Customer happiness can be created through the experience of the customers while using a particular mobile app through the characteristics and wide range of features given by the advanced mobile apps (Shaban Abdelmoteleb et al., 2017). Therefore, operating systems like Android phones or tablets make the customers choose from existing templates and this improves their experience which influences in turn their happiness. The types and a range of color themes available on the system customize customers' attitudes and this can give their responses using mobile devices (Dedema & Zhang, 2019). Accordingly, the present study hypothesizes the following research hypothesis:

H₁₀: *Attitude to use GMA has a significant positive effect on customers' happiness.*

Considering the emotions and the key affective factor is essential in using mobile applications. Therefore, customers in general do not have similar beliefs and desires which they are looking for to meet and fulfil, and the emotional experience and feeling display how their beliefs and desires can be met through the interactions with the mobile application usage (Ding & Chai, 2015). The results demonstrated that feelings can be influenced by the usage of products or services and the customers' decision making, particularly in the uncertain situations indicating the emotions and feelings impact customers' behaviour (Verkijika & De Wet, 2019). However, the desirable actions can be pursued with the engagement rather than those undesirable actions. The customers may engage in some behaviors to recognize their emotions. The literature also demonstrated that customers regulate their own emotions by using products. As a result, good use of products focuses on increasing their engagement with an effect on the user's emotions (Zheng, 2020). Accordingly, the present study hypothesizes the following research hypothesis:

H₁₁: *The use of GMA has a significant positive effect on customers' positive emotions.*

Making customers happy with positive feelings is a great concern and aims for today's enterprises and businesses which this factor leads to meet strategic goals for the business (Zhan & Zhou, 2018). For this reason, the businesses are turning their marketing efforts toward several methods and ways to create a genuine engagement for customer experience development. For mobile applications, designing innovative features and developing attractive aspects within the mobile applications represent a link that can get close attention of the customers (Zhong et al., 2019). The business now concerns knowing how to harness the influence of mobile apps to change customer feeling positively for advantage gaining. The mobile apps act like a personal metronome, which makes a pace of daily basis work, thus the customers mainly rely on mobile devices to carry out their important different activities e.g. entertainment, communication, and shopping (Zhao et al., 2022). Accordingly, the present study hypothesizes the following research hypothesis:

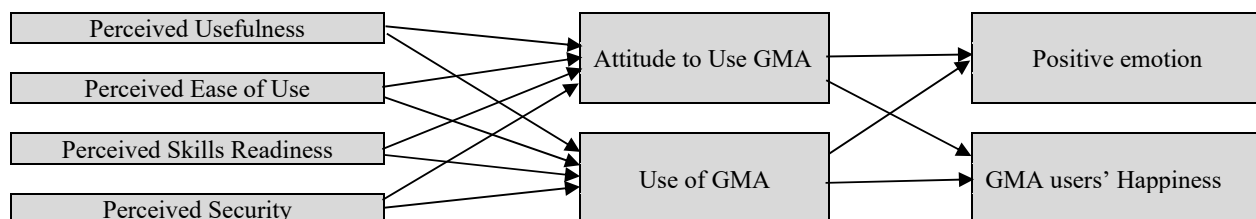**H₁₂**: the use of GMA has a significant positive effect on customers' happiness.

Fig. 1. Conceptual Research Framework

2. Method

The study used a research design of quantitative study approach with cross-sectional to achieve the present research objectives. In general, the research design is based on collecting data from the target sample and population through a survey questionnaire and running some analytical procedures to gain the key findings. Moreover, the study population and sample concern the users of the government mobile apps. The sample participated in the study of around 340 people from different backgrounds and levels of using different government services mobile apps. The study instrument that is used to collect data has been validated through a panel of experts and professionals in the study field. Content validity was conducted also regarding the measurement wordings to make sure they are understandable with low confusion. Some amendments and suggestions were conducted to enhance the study measures by drafting the final valid measuring items before the distribution process. Arabic edition was distributed to the target sample which is the workforces with adequate knowledge of Arabic. The questionnaire was divided into some parts including participants' demographics and variables items which they were built based on the relevant literature (i.e. Malik et al., 2017; Tamilmani et al., 2018; Zhu et al., 2017).

The use of research with the approach of structural equation modelling motivates this study to consider the key analysis. The arguments of determining the minimum sample size with more than 200 participants confirmed as adequate size to carry out this research based on the approach of maximum likelihood estimation. Further, the research concerns analyzing the data by using the program of SmartPLS3 to provide key statistics and analysis outputs. Hence, the data analysis procedures regarding this method significantly are given with the variables which are drawn with the measuring items as well interrelated with the variables outcomes to represent the shape of relations among study constructs. The SEM approach interests with analyzing the links between some functional latent constructs. So that there are two common types of models in this approach of both measurement and structural model. Each type of model has a unique analysis and is carried out to test the validity and test the hypotheses. As the research constructs have been drawn and converted into various measures to gauge the factors by using five Likert scales strongly disagree to strongly agree. The study illustrated the respective interested causal relations of the variables that are formulated based on the theoretical base with the framework analysis for hypothesized paths testing.

3. Results

A total of 340 valid completed responses were considered in this study with a response rate of (61%). The demographics analysis showed most of the study responses were male 71.9% but the female represents about 28.1%. The aging group of the sample showed around 34.1% aged between 40-50 years old (116), followed by those aged between 30-40 years old (105) with a percentage of 31.3%, the results of educational level found most of the participants hold a bachelor's degree 43.2% (147), followed by those graduates' level (49) with a percentage of 14.4% as presented in Table 1 below.

Table 1
Sample Demographic

Variable	Frequency	Percentage
Gender		
Male	245	71.9
Female	95	28.1
Age		
20-30 years	80	23.5
30-40 years	116	34.1
40-50 years	109	32.0
Above 50	35	10.3
Educational level		
Diploma and less	44	12.9
Bachelor's degree	147	43.2
Graduates	49	14.4

The reliability issues of the research is important because the present study conducted this analysis procedure that includes examining also the validity of the model indicators through composite reliability CR, average variance extracted AVE and Cronbach's Alpha. The next research sections are given the significant analysis findings to clearly understand the study major validity and reliability features.

4.1 Measurement model

The analysis begins with the analysis of the measurement study. The important aspects of this analysis are confirmatory factor analysis that is generally conducted using an approach of structural equation modelling SEM to assess the measurement's reliability and validity. The key findings confirmed reliable constructs based on the given results related to the reliability measures such as CR, the obtained results showed greater than 0.70 (e.g Price et al., 2015). The instrument measures were ranked by five-point Likert scale. The discriminant validity of the present research is also determined by the values of AVE which represent the constructed correlations, the recommended threshold of measurement model results of this type of validity should be less than 0.85. Further, the results of AVE indicate another kind of validity namely convergent validity with values less than 0.50 as given in Table 2 and Fig. 1.

Table 2
Validity Results

Indicators	Loadings	CR	AVE	Alpha
Perceived Usefulness		0.887	0.761	0.895
PU1	0.850			
PU2	0.879			
PU3	0.878			
PU4	0.882			
Perceived Ease of Use		0.865	0.689	0.849
PE1	0.872			
PE2	0.820			
PE3	0.815			
PE4	0.812			
Perceived Skills Readiness		0.901	0.693	0.852
PS1	0.827			
PS2	0.820			
PS3	0.836			
PS4	0.847			
Perceived Security		0.886	0.701	0.858
PS1	0.833			
PS2	0.847			
PS3	0.844			
PS4	0.825			
Attitude to GMA		0.843	0.725	0.873
AGMA1	0.842			
AGMA2	0.856			
AGMA3	0.844			
AGMA4	0.863			
Use of GMA		0.801	0.743	0.884
GMA1	0.887			
GMA2	0.816			
GMA3	0.863			
GMA4	0.880			
Positive emotion		0.801	0.611	0.682
PE1	0.772			
PE2	0.819			
PE3	0.752			
Users' Happiness		0.765	0.685	0.770
UH1	0.882			
UH2	0.891			
UH3	0.695			

4.2 Structural model

A prior prerequisite analytical procedure should be aware before running the path analysis and test the hypotheses is checking the multicollinearity among study variables. It is conducted to ensure data models do not violate the regression analysis assumptions. About the assumption, the current study conducted the analysis to assess the correlation issues using the common criterion of Variance Inflation Factor VIF linked with the values of Tolerance. Looking at the results confirmed the acceptable values of this examination for the respective variable which got less than (5.0) indicates this analysis has no high correlation between model variables, thus this indicates no problematic issue with multicollinearity of the variables and range (4.564-4.113). So, this confirmed the model had a normal data distribution as the values of the skewness and kurtosis less than (1), and the model validity also confirmed the analysis for research hypotheses testing.

Table 3
Multicollinearity Test

Variable	VIF	Tolerance	Skewness	Kurtosis
Perceived Usefulness	4.121	0.287	0.565	0.743
Perceived Ease of Use	3.554	0.392	0.467	0.687
Perceived Skills Readiness	4.675	0.298	0.680	0.531
Perceived Security	3.556	0.288	0.621	0.458
Attitude to GMA	3.101	0.267	0.509	0.522
Use of GMA	4.171	0.387	0.672	0.480
Positive emotion	3.988	0.321	0.632	0.501
Users' Happiness	3.761	0.342	0.609	0.511

The study also evaluated the structural model through PLS-SEM analysis to examine the model paths and the association among the constructs to investigate the study hypotheses. Figure 1 is the conceptual model with the paths being tested using SEM analysis and maximum likelihood approach. The findings showed the weights of the standardized regression (β) and significance level of all paths. Through the results of the standardized coefficients that are used to interpret the constructs association, so proved the studied paths. So, the results showed the perceived usefulness is positively associated with the attitude to use GMA (β = 0.317, t = 4.254, p = 0.000), and this supports H1. The results also revealed the perceived usefulness

is positively associated with the use of GMA ($\beta = 0.322$, t = 3.221, p = 0.000), and this supports H2. In addition, the perceived ease of use is positively associated with the attitude to use GMA ($\beta = 0.213$, t = 2.402, p = 0.000), and this supports H3. Further, the perceived ease of use is positively associated with the use of GMA ($\beta = 0.123$, t = 2.921, p = 0.000), and this supports H4. The results of the perceived skills readiness with the attitude to use government GMA also supported the H5 ($\beta = 0.247$, t = 4.063, p = 0.000). The results of the perceived skills readiness with the use of GMA also supported the H6 ($\beta = 0.392$, t = 5.899, p = 0.000). The results of the perceived security with the attitude to use government GMA also supported the H7 ($\beta = 0.392$, t = 5.899, p = 0.000). The results of the perceived security with the use of GMA also supported the H8 ($\beta = 0.355$, t = 4.011, p = 0.000). The results of the attitude to use GMA with the customers' positive emotion supported the H9 ($\beta = 0.473$, t = 6.878, p = 0.000). The results of the attitude to use GMA with the customers' happiness supported the H10 ($\beta = 0.147$, t = 2.761, p = 0.000). The results of the use of GMA with the customers' positive emotion supported the H11 ($\beta = 0.200$, t = 2.997, p = 0.000). The results of the use of GMA with the customers' happiness supported the H12 ($\beta = 0.227$, t = 2.470, p = 0.000).

Table 4
Direct Hypotheses Results

Path	β	SD	T	P	Decision
Perceived usefulness → attitude to use GMA	0.317	0.026	4.254	<0.01	Supported
Perceived usefulness → the use of GMA	0.322	0.024	3.221	<0.01	Supported
Perceived ease of use → attitude to use GMA	0.213	0.037	2.402	<0.05	Supported
Perceived ease of use → the use of GMA	0.123	0.038	2.921	<0.05	Supported
Perceived skills readiness → attitude to use GMA	0.247	0.031	4.063	<0.01	Supported
Perceived skills readiness → the use of GMA	0.241	0.033	3.873	<0.01	Supported
Perceived security → attitude to use GMA	0.392	0.034	5.899	<0.01	Supported
Perceived security → the use of GMA	0.355	0.039	4.011	<0.01	Supported
Attitude to use GMA → customers' positive emotion	0.473	0.029	6.878	<0.01	Supported
Attitude to use GMA → customers' happiness	0.147	0.030	2.761	<0.05	Supported
The use GMA → customers' positive emotion	0.200	0.037	2.997	<0.05	Supported
The use GMA → customers' happiness	0.227	0.022	2.470	<0.05	Supported

4. Discussion

The study findings provided several insights related to the factors that are influencing the customers' attitudes toward adopting e-government mobile applications and to extent this adoption can also influence the customers' positive emotion and happiness. The findings supported some of the hypothesized model paths and supported all of them since these factors are more critical for customers while evaluating their attitude toward the e-government mobile applications. The government's transformation into digitalization of its different services leads to a realistic assessment of the resources and capabilities possessed by government bodies, in addition to serving a larger segment of the target audience and contributing to raising the quality of life for all segments of society, and shifting to a green, environmentally friendly government. The customers in this way in the previously inaccessible areas can receive related governmental services follow-up, notifications and alerts via mobile services. the study through the factors influencing this topic supported the characteristics that commonly used to evaluate the technology acceptance including the level of providing a creative solution to a problem is presented in an innovative way outside the usual approach that has not been addressed previously and has contributed significantly to improving the method of service delivery and the customer experience, and also includes providing interconnected service packages.

The factor of efficiency and effectiveness indicates a criterion that concerns with evaluating the effectiveness of the mobile applications in solving a specific problem identified through customers' opinions and suggestions and the extent of the application's ability to provide the service more happily. Similarly, the characteristics of ease of use focuses on the basic functionality of the applications (application capabilities) and the options the mobile applications provide including simplicity of design and ease of navigation and access to the service which stand with study of Zhu et al. (2017). The mobile applications have become the dominant form of digital interactions due to its spread and mobility; as the customers spend more time with mobile applications than they do, the applications developers give further attention to increase positive customers emotions and happiness via the web. And this also provides a wealth of applications, and therefore, the public's use of mobile applications via smart phones involves several complex and interactive processes, linked to the characteristics of the mobile phone as a technological means of communication that employs the Internet and other modern communications technology. And it is also linked to the characteristics of the consumer and his awareness of the benefits gained from them, which play their role as forcing drivers as supported by Tian et al. (2021).

Internal and external drivers of customers' behavior, in addition to the outcomes of this use, which are represented by set of effects related to the brand and the user's usage intentions. This makes there an urgent need to analyze the motivations driving users of mobile applications while accomplishing government services and the effects of this use. Moreover, the literature confirmed the importance of the electronic government services via mobile applications are services provided by government agencies to people via mobile devices, especially smart phones (Tamilmani et al., 2018). These services may include a wide range of applications and features, such as government inquiries, administrative services, electronic payment, problem reporting, and many more. The aim of these services is to improve efficiency, transparency, and convenience for users by providing government services in an easy, convenient and fast way via mobile phone. Therefore, people may be able to pay taxes and

bills, register for health services, or view the status of an application at a government institution, all through a government application on their smartphone. Moreover, the psychological factors of the customers classify and confirm that positive emotion expresses a group of elements (satisfaction, optimism, and hope) and happiness precedes perception, satisfaction, and attitudes. For example, the emotional happiness is managed by measuring perception of satisfaction and the culture of customers plays an important role, such as frequency, the degree of positivity in the individual, and staying away from negative feelings such as depression, anxiety, and constant thinking about things that stimulate fear, as well as the level of satisfaction during a specific period of time (Ahn, 2022). On the negativity and affect satisfaction in life, and hence happiness always involves different aspects e.g emotional or cognitive. The widespread attention of this outcome has been called for by different research fields that focus on people's happiness and emotions (Rahardja et al., 2023). There are some researchers who have used the term between the two and that happiness is strongly psychologically linked to individual happiness and well-being in an interchangeable manner, meaning that they have proven that there is a significant psychological and physiological connection with well-being. Although well-being requires several things to be achieved, it must include components of emotion and knowledge.

In addition to the above, the results related to the factor of customer happiness is an important marketing concept which has found it difficult to determine in maintaining the customers happiness. Thus, happiness is something that marketers have, and it depends on the basis of the relations with customers, so the organization should create positive feelings of happiness to form successful and sustainable relations with the customers. However, the customers could be happy with the technological development and revolution, which were spending a lot of effort to satisfy them. Happiness also refers to the customer's pleasure, as subjective experiences that generally consider the customers' beliefs important and contain a pleasant effect, which usually goes alongside the belief. In the context of the importance of studying customer happiness, the discussions have indicated that it works effectively with emotions and that it has a positive effect on them, even if there is difficulty at work or in life (Ahmed Al Hosani & Zainol, 2021). Moreover, the essential role for happiness can define some points related to the reasons of the organization's existence, so it is necessary for them to considering the happiness factor and customer service in an appropriate manner, given the presence of many competing organizations that can provide the same service (Alshurideh et al., 2023; Al Kurdi et al., 2023). Generally, with the possible delay in responding to the customer demands or complaints, and between this or that problem and its solution it is too late, and the customer has left for the competing organization. Understanding and knowing customers' reactions as a result of the service, whether positive or negative, due to the difficulty of predicting the perceptions that are generated as a result of bad service (Alhammadi & Alshurideh, 2023).

6. Conclusion & Implications

6.1 Theoretical implication

In general, the theoretical implication of the current study confirmed that the government services are not stable; and the changes across this context are increasing over time. This indicates a lack of stability of adopting government mobile applications quality. The application's quality might further enhance the ways of incorporating and implementing significant related aspects. This development can be made by highlighting the security, usefulness, skills and availability elements that can meet customers' expectations. The research's theoretical contributions include exploring the government mobile applications using smart phones for government mobile applications quality (e.g., security, ease of use, and skills readiness) are applicable within various public organizations. The results linked to those elements of the mobile applications benefits also show an importance of designing standardized frameworks of the rendered services within the public sector organizations to enhance customer positive emotion and happiness at their experiences of government services. Significantly, the study findings reaffirm the sequence of the mobile applications quality elements. The implications best reflect the causal relations between factors related to technology acceptance and customer happiness. It also provides evidence of the relations between the key elements of mobile applications quality. For instance, perceived usefulness exerted a significant factor on use of GMA which in turn led to customer happiness. In other words, the results showed that use of GMA and attitude to GMA indirectly influence customer happiness and positive emotion which can narrow the literature gap in this topic.

6.2 Practical implication

This study aimed to examine the factors influencing customers' attitudes toward adopting E-government mobile applications in the customers' positive emotion and happiness in the presence of attitude to GMA and use of GMA. The findings elucidated the most stated factors in this study that had significant influence on customers' positive emotion and happiness. Some practical implications based on research results provided to the government. First, the government bodies that provide public services should understand that a service brings no happiness for the customers even if they are satisfied with it. Thus, the developers should introduce some experiences while the customers communicate with their services. Such experiences should also be associated with customers' emotional status. The examples may include creating awareness events in which the customers use their services. In addition, an emphasis should be directed to the factors or aspects that increase customer happiness such as the customers who seek life experiences that the government mobile applications add to the customers. Further, the root of customer happiness may be explained in a context that the customers' experiences of a service itself or support mobile

applications related to happiness. The developers of mobile applications should integrate the emerging digital tools like social media into their strategies that can enhance the customer happiness and consequently improve their positive emotions.

6.3 Recommendation and limitation

Despite its significant findings, the present research is theoretically limited with the aim of exploring the influencing factors related to mobile applications on customer happiness and positive emotion; so, the research is required to investigate different effects of new factors on customer happiness and positive emotion like experiential relations quality. Another study limitation is related to the data collected from samples of users of the government mobile apps. Hence, the findings may be based due to the response's personal characteristics such as littler mobile applications experiences. The future research should consider the preferences of the customers to identify the extent mediation influencing factors increase the relations acceptance technology factors and people attitudes like happiness. The present research revealed that perceived ease of use had no significant impact on positive emotion through attitude to GMA, further studies of such new results are required.

References

Abikari, M., Öhman, P., & Yazdanfar, D. (2022). Negative emotions and consumer behavioural intention to adopt emerging e-banking technology. *Journal of Financial Services Marketing*, 1–14. https://doi.org/https://doi.org/10.1057/s41264-022-00172-x

Ahmed Al Hosani, A. I., & Zainol, Z. (2021). The Impact of Customer Experience on the E-government success: Mediating Role of Customer Happiness. *Turkish Online Journal of Qualitative Inquiry*, *12*(6), 4693–4709.

Ahn, J. (2022). Impact of cognitive aspects of food mobile application on customers' behaviour. *Current Issues in Tourism*, *25*(4), 516–523.

Alalwan, A. A., Dwivedi, Y. K., Rana, N. P. P., & Williams, M. D. (2016). Consumer adoption of mobile banking in Jordan: Examining the role of usefulness, ease of use, perceived risk and self-efficacy. *Journal of Enterprise Information Management*, *29*(1), 118–139.

Alhammadi, S. M. K., & Alshurideh, M. T. (2023). Factors Affecting Customers' Happiness: A Systematic Review in the Service Industries. *International Conference on Advanced Intelligent Systems and Informatics*, 510–526.

Al Kurdi, B., Alshurideh, M. T., Akour, I., Alzoubi, H. M., Obeidat, Z. M., Hamadneh, S., & Joghee, S. (2023). Factors affecting team social networking and performance: The moderation effect of team size and tenure. Journal of Open Innovation: Technology, Market, and Complexity, 9(2), 1-10.

Almaiah, M. A., & Al Mulhem, A. (2019). Analysis of the essential factors affecting of intention to use of mobile learning applications: A comparison between universities adopters and non-adopters. *Education and Information Technologies*, *24*, 1433–1468. https://doi.org/https://doi.org/10.1007/s10639-018-9840-1

Alshurideh, M. T., Al Kurdi, B., Alzoubi, H. M., Akour, I., Obeidat, Z. M., & Hamadneh, S. (2023). Factors affecting employee social relations and happiness: SM-PLUS approach. Journal of Open Innovation: Technology, Market, and Complexity, 9(2), 1-10.

Altuwaijri, F. S., & Ferrario, M. A. (2022). Factors affecting Agile adoption: An industry research study of the mobile app sector in Saudi Arabia. *Journal of Systems and Software*, *190*, 111347. https://doi.org/https://doi.org/10.1016/j.jss.2022.111347

Balapour, A., Nikkhah, H. R., & Sabherwal, R. (2020). Mobile application security: Role of perceived privacy as the predictor of security perceptions. *International Journal of Information Management*, *52*, 102063. https://doi.org/https://doi.org/10.1016/j.ijinfomgt.2019.102063

Chaouali, W., Lunardo, R., Ben Yahia, I., Cyr, D., & Triki, A. (2020). Design aesthetics as drivers of value in mobile banking: does customer happiness matter? *International Journal of Bank Marketing*, *38*(1), 219–241.

Choi, J. (2020). How creative mindset is involved in positive emotions and attitude that affects creative design process. *Advances in Interdisciplinary Practice in Industrial Design: Proceedings of the AHFE 2019 International Conference on Interdisciplinary Practice in Industrial Design, July 24-28, 2019, Washington DC, USA 10*, 3–12.

Chopdar, P. K., Korfiatis, N., Sivakumar, V. J., & Lytras, M. D. (2018). Mobile shopping apps adoption and perceived risks: A cross-country perspective utilizing the Unified Theory of Acceptance and Use of Technology. *Computers in Human Behavior*, *86*, 109–128. https://doi.org/https://doi.org/10.1016/j.chb.2018.04.017

Dedema, & Zhang, P. (2019). "Happy Rides Are All Alike; Every Unhappy Ride Is Unhappy in Its Own Way": Passengers' Emotional Experiences While Using a Mobile Application for Ride-Sharing. *Information in Contemporary Society: 14th International Conference, IConference 2019, Washington, DC, USA, March 31–April 3, 2019, Proceedings 14*, 706–717.

Dewi, G. M. M., Joshua, L., Ikhsan, R. B., Yuniarty, Y., Sari, R. K., & Susilo, A. (2021). Perceived risk and trust in adoption E-wallet: the role of perceived usefulness and ease of use. *2021 International Conference on Information Management and Technology (ICIMTech)*, *1*, 120–124.

Ding, Y., & Chai, K. H. (2015). Emotions and continued usage of mobile applications. *Industrial Management & Data Systems*, *115*(5), 833–852.

Gera, R., Chadha, P., & Ahuja, V. (2020). Mobile app usage and adoption: A literature review. *International Journal of Electronic Business*, *15*(2), 160–195.

Gharaibeh, M. K., Arshad, M. R. M., & Gharaibh, N. K. (2018). Using the UTAUT2 model to determine factors affecting adoption of mobile banking services: A qualitative approach. *International Journal of Interactive Mobile Technologies*, *12*(4), 123–143.

Han, P.-K., Park, J.-S., Jun, B.-H., & Kang, B.-G. (2010). A study on the factors of mobile applications adoption. *Journal of Information Technology Services*, *9*(3), 65–82.

Handayani, P. W., Indriani, R., & Pinem, A. A. (2021). Mobile health readiness factors: From the perspectives of mobile health users in Indonesia. *Informatics in Medicine Unlocked*, *24*, 100590. https://doi.org/https://doi.org/10.1016/j.imu.2021.100590

Hirschtritt, M. E., & Insel, T. R. (2018). Digital technologies in psychiatry: present and future. *Focus*, *16*(3), 251–258.

Indarsin, T., & Ali, H. (2017). Attitude toward Using m-commerce: The analysis of perceived usefulness perceived ease of use, and perceived trust: Case study in Ikens Wholesale Trade, Jakarta–Indonesia. *Saudi Journal of Business and Management Studies*, *2*(11), 995–1007.

Lui, T. K., Zainuldin, M. H., Yii, K.-J., Lau, L.-S., & Go, Y.-H. (2021). Consumer Adoption of Alipay in Malaysia: The Mediation Effect of Perceived Ease of Use and Perceived Usefulness. *Pertanika Journal of Social Sciences & Humanities*, *29*(1), 389–418.

Malik, A., Suresh, S., & Sharma, S. (2017). Factors influencing consumers' attitude towards adoption and continuous use of mobile applications: a conceptual model. *Procedia Computer Science*, *122*, 106–113. https://doi.org/https://doi.org/10.1016/j.procs.2017.11.348

Malik, A., Suresh, S., & Sharma, S. (2019). An empirical study of factors influencing consumers' attitude towards adoption of wallet apps. *International Journal of Management Practice*, *12*(4), 426–442.

Min, S., So, K. K. F., & Jeong, M. (2021). Consumer adoption of the Uber mobile application: Insights from diffusion of innovation theory and technology acceptance model. In *Future of tourism marketing* (pp. 2–15). Routledge.

Nangin, M. A., Barus, I. R. G., & Wahyoedi, S. (2020). The effects of perceived ease of use, security, and promotion on trust and its implications on fintech adoption. *Journal of Consumer Sciences*, *5*(2), 124–138.

Nguyen, T. M. H. (2018). *The impact of emotions on customer experience through using mobile application for food ordering in Finland*.

Okoroji, V., Lees, N., & Lucock, X. (2021). *Factors affecting the adoption of mobile applications by farmers: An empirical investigation*. *17*(1), 19–29.

Price, P. C., Jhangiani, R. S., & Chiang, I.-C. A. (2015). Reliability and validity of measurement. In *Research methods in psychology*.

Rahardja, U., Sigalingging, C. T., Putra, P. O. H., Nizar Hidayanto, A., & Phusavat, K. (2023). The impact of mobile payment application design and performance attributes on consumer emotions and continuance intention. *SAGE Open*, *13*(1), 1–18.

Shaban Abdelmoteleb, A. A., Kamarudin, S., & E Nohuddin, P. N. (2017). Data driven customer experience and the roadmap to deliver happiness. *Marketing and Branding Research*, *4*(2017), 236–248.

Sharma, E. (2020). Developing ICT adoption model based on the perceived awareness and perceived usefulness of technology among telecom users. *International Journal of Technology Enhanced Learning*, *12*(1), 99–114.

Silva, G. M., Dias, Á., & Rodrigues, M. S. (2022). Continuity of use of food delivery apps: An integrated approach to the health belief model and the technology readiness and acceptance model. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(3), 114. https://doi.org/https://doi.org/10.3390/joitmc8030114

Sudono, F. S., Adiwijaya, M., & Siagian, H. (2020). The influence of perceived security and perceived enjoyment on intention to use with attitude towards use as intervening variable on mobile payment customer in Surabaya. *Petra International Journal of Business Studies*, *3*(1), 37–46.

Sukhu, A., Choi, H., Bujisic, M., & Bilgihan, A. (2019). Satisfaction and positive emotions: A comparison of the influence of hotel guests' beliefs and attitudes on their satisfaction and emotions. *International Journal of Hospitality Management*, *77*, 51–63. https://doi.org/https://doi.org/10.1016/j.ijhm.2018.06.013

Tamilmani, K., Rana, N. P., & Dwivedi, Y. K. (2018). Mobile application adoption predictors: systematic review of UTAUT2 studies using weight analysis. *Challenges and Opportunities in the Digital Era: 17th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2018, Kuwait City, Kuwait, October 30–November 1, 2018, Proceedings 17*, 1–12.

Tarhini, A., Alalwan, A. A., Shammout, A. B., & Al-Badi, A. (2019). An analysis of the factors affecting mobile commerce adoption in developing countries: Towards an integrated model. *Review of International Business and Strategy*, *29*(3), 157–179.

Tian, Z., Lu, M., & Cheng, Q. (2021). The relationships among mobile travel application attributes, customer engagement, and brand equity. *Social Behavior and Personality: An International Journal*, *49*(7), 1–10.

Verkijika, S. F., & De Wet, L. (2019). Understanding word-of-mouth (WOM) intentions of mobile app users: The role of simplicity and emotions during the first interaction. *Telematics and Informatics*, *41*, 218–228. https://doi.org/https://doi.org/10.1016/j.tele.2019.05.003

Vulpe, A., & Dafinoiu, I. (2011). Positive emotions' influence on attitude toward change, creative thinking and their relationship with irrational thinking in Romanian adolescents. *Procedia-Social and Behavioral Sciences*, *30*, 1935–1941. https://doi.org/https://doi.org/10.1016/j.sbspro.2011.10.376

Vvan den Berg, J., & Van der Lingen, E. (2019). An empirical study of the factors affecting the adoption of mobile enterprise applications. *South African Journal of Industrial Engineering*, *30*(1), 124–146.

Wang, R. J.-H. (2020). Branded mobile application adoption and customer engagement behavior. *Computers in Human Behavior*, *106*, 106245. https://doi.org/https://doi.org/10.1016/j.chb.2020.106245

Widyanto, H. A., Kusumawardani, K. A., & Yohanes, H. (2022). Safety first: Extending UTAUT to better predict mobile payment adoption by incorporating perceived security, perceived risk and trust. *Journal of Science and Technology Policy Management*, *13*(4), 952–973.

Wong, W. H., & Mo, W. Y. (2019). A study of consumer intention of mobile payment in Hong Kong, based on perceived risk, perceived trust, perceived security and Technological Acceptance Model. *Journal of Advanced Management Science Vol*, *7*(2), 33–38.

Zhan, G., & Zhou, Z. (2018). Mobile internet and consumer happiness: the role of risk. *Internet Research*, *28*(3), 785–803.

Zhao, C., Li, X., & Yan, J. (2022). The effect of digital finance on Residents' happiness: the case of mobile payments in China. *Electronic Commerce Research*, *2022*, 1–36. https://doi.org/https://doi.org/10.1007/s10660-022-09549-5

Zhao, Y., Ni, Q., & Zhou, R. (2018). What factors influence the mobile health service adoption? A meta-analysis and the moderating role of age. *International Journal of Information Management*, *43*, 342–350. https://doi.org/https://doi.org/10.1016/j.ijinfomgt.2017.08.006

Zheng, L. (2020). The role of consumption emotions in users' mobile gaming application continuance intention. *Information Technology & People*, *33*(1), 340–360.

Zhong, Y., Chung, J.-E., & Moon, H.-C. (2019). Determinants of Customer Satisfaction, Loyalty and Happiness in Chinese Fast-food Restaurants in the 4 th Industrial Revolution Era; Is Convenience of Mobile Ordering Services a New Determinant? *Korea Trade Review*, *44*(6), 151–168.

Zhu, G., So, K. K. F., & Hudson, S. (2017). Inside the sharing economy: Understanding consumer motivations behind the adoption of mobile applications. *International Journal of Contemporary Hospitality Management*, *29*(9), 2218–2239.