Investigating the Determinants of Attitude, Use and Happiness of UAE Government Mobile Apps (GMA) Users : A Quantitative Approach in the UAE

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ARTICLE DETAILS	ABSTRACT
	The primary objective of this paper is to examine how attitude to use may influence the use of mobile applications which in turn influence mobile users' happiness in the context of the UAE government service sector. The paper tries to use an extension of the Technology Acceptance Model (TAM) to investigate the effect of different variables on mobile users' attitudes towards the utilization of government mobile applications (GMAs). The significance of this thesis is based on the fact that it attempts to fill the gap regarding factors that affect the adoption and user happiness with the government mobile apps especially in the UAE where the utilization of the mobile apps is strategic for the delivery of efficient public services. By employing a quantitative approach, this paper obtained statistical data from a sample of 477 participants, which include UAE citizens and residents using one of GMAs provided by the Ministry of Interior (MOI). This paper is used mainly seven variables that predict degree of users' happiness, including perceived trustworthiness, perceived effort expectancy, perceived app quality, perceived ease of use, perceived skills readiness, perceived security, and perceived usefulness. The findings highlight that higher perceptions towards mobile apps are significant predictors of user attitude and usage patterns. Additionally, the paper identifies that higher levels of each perceptions contribute to greater user of mobile apps use and happiness. Evidences from this paper may enrich the understanding of how governments can improve the adoption of modern technologies such as mobile apps and drive happiness among users.

I. INTRODUCTION

Given the current increased adoption of digitization in service delivery, mobile applications are now key in delivering public services. In particular, during the recent years, the UAE government has developed several applications through which the government can interact with the citizens more effectively and the service delivery process can be optimized. Given that use of mobile apps is becoming more and more integral to the functioning of a government, it is imperative for the reasons behind the use, attitude to use and happiness with the applications. The significance of this research is derived from the possible contribution towards identifying possible areas, through which the UAE government can promote the design, functionality and usability of its mobile apps. Therefore, by examining users' attitude toward using these apps, and their happiness index of the apps, this study will help to advance the understanding of government service adoption in the digital age. This is even more relevant because the UAE is already actively working toward becoming a country of the future with cutting-edge technologies. By knowing these determinants, policy makers and developers can improve these applications to deliver better services and satisfy the citizens.

The current research on TAM has pointed out some determinants of the usage of the technology such as ease of use and perceived usefulness of the technology. Proposing TAM to examine determinants of user attitude regarding government mobile apps provide scope to examine such factors as quality, security and perceived usefulness of government mobile apps services. Prior studies in the context of government adoption have also revealed that user happiness are key factors that define further usage, so it is important to analyze the

affective and cognitive mobile app use. The purpose of this study is to utilize an extended version of TAM in order to understand these factors regarding UAE Government Mobile Apps through a quantitative method to investigate the role of attitude and usage in relation to the user's happiness. Moreover, this thesis focuses on user habits of mobile app developed by the government of UAE, and one of GMAs provided by the Ministry of Interior (MOI). However, this research stresses on the dimensions of user behavior. The primary focus is on factors which drives the attitude and actual usage of these apps, and to make it distinctive with extension to the happiness measure of the users. Through extension of TAM, this study can contribute to the existing research, providing new insights about the determinants that affect utilization of the government mobile apps and ultimately result in the happiness. The research proceeds from the base TAM model in which perceived ease of application and perceived usefulness are major predictors of the customer adoption of technology. It includes not just these factors here but also other factors that show users' happiness. It highlights and assesses various factors that affect users' perspective, perception, and experience.

1.1. The research problem

Over decades, business scholars have engaged in a rigorous research process to measure the degree of users' happiness with various services based on their evaluations and self-reported customer feedback (Farzana Banu & Jayam, 2021). Such measurements have become critical for businesses by providing an important tool for continuous improvements to better experiences and increasing customer satisfaction and happiness (Norton et al., 2010). However, these studies (Kanaan et al., 2023; Alzoubi, 2020) have not narrowed their scope on how modern technologies like mobile applications affect customer happiness, particularly in the UAE government service sector. Mobile apps have been vital in business operations because they enhance customer happiness by providing seamless, instant access to services and personalized experiences, making interactions more convenient and satisfying (Apaua & Lallie, 2022). Moreover, as governments worldwide are gradually investing in digital transformation, it is crucial not only to understand the nature of the user engagement with government mobile platforms but also the technological and contextual factors influencing their intentions, attitudes, in use toward happiness. Despite the extensive research conducted on the TAM to predict the usage of technologies, still, the usage of TAM with reference to UAE Government Mobile Apps and the relation with user happiness is not much discussed (Farzana Banu & Jayam, 2021). Since the UAE has been advancing its technology and applying it to various sectors including government through its smart city projects, it is important to identify factors that determine the usage of GMA, especially from the point of view of user and their interest in the particular service (Huwari et al., 2023). Just as in the business and private sector, mobile apps will improve customers' satisfaction and their happiness at workplace (Harris et al., 2016). Lack of mobile apps knowledge in the UAE government may cause unhappy client and reduce their urge to seek government service. Thus, it is essential to consider this research topic that may enrich the understanding of perceptions regarding service value delivered by mobile apps and their impacts on customer happiness.

1.2. The research objective
The thesis is aimed at achieving the following objectives:

1- To explore the impact of the identified factors that shapes the users' attitude to use UAE government mobile apps (GMAs) with the emphasis on perceived trustworthiness, perceived security and perceived quality, perceived skills readiness, perceived usefulness, perceived ease of use and perceived effort expectancy.
2- To investigate the effect of UAE Government Mobile Apps (GMAs) use on users' happiness.

1.3. The Research questions
To augment the Technology Acceptance Model (TAM), whose primary components are the perceived usefulness and ease of use, this study tries to understand the users' happiness as an outcome variable (Na et al., 2023). The study aims to investigate the positive influence between GMAs use and satisfaction by shining a light on the underlying mechanisms that influence the feelings of citizens and residents in the UAE who are using government services and digital platforms. Based on the above discussion, the questions of the study are drawn as:

1. What are the main predetermines of users' attitude toward using GMAs?
2. What are the factors affecting attitude to use influence actual use of GMAs
3. What are the factors affect the use of GMAs influence users' happiness?

1.4. Significance of the study
Exploring the determinants of attitude and use of UAE Government Mobile Apps (GMAs) users' happiness within the Ministry of Interior presents significant opportunities for advancing knowledge in several critical areas. By extending the Technology Acceptance Model (TAM), this study can investigate the specific contextual factors influencing user perceptions and behaviors of governmental setting focused on police services and traffic services. Additionally, investigating the role of user' attitude to use on the GMAs use help in designing different governmental applications especially when data is collected from users' point of view which in turn also may enhancing users' usability and happiness (Salloum et al., 2021). Also, happiness can provide actionable insights for improving GMAs functionality and adoption. Moreover, examining the attitude to use determinants and use effect on happiness within the Ministry of Interior in UAE can offer nuanced understandings of how governmental policies and governance frameworks shape user interactions with digital services, thereby contributing to more effective public service delivery and enhanced user experiences (Sharma et al., 2018). Studying the factors influencing attitude and usage of UAE Government Mobile Apps (GMA) users' happiness for the application "Ministry of Interior" offers

research findings in various major fields of study. By expanding the scope of the TAM of this study, it is possible to identify the specific context barriers and enablers that may affect users' perception and usage of the technology of the governmental organization related to police services and traffic services. This may lead to potential directions for future research in examining the role of the users' perceptions towards mobile GMAs use (Kondrateva et al., 2020). Further, the exploration of user users' happiness about apps use can also give insights on how to advance or optimize the compact and usability of GMAs.

2. THEORETICAL FRAMEWORK

Over the past decades, the United Arab Emirates (UAE) region has witnessed spanning developments and successful transformations across the economic, technological and social divides (Blooshi et al., 2023). Today, the seven Emirates that make up the UAE have set themselves on a highly ambitious course by embracing modern digital technologies, which hold a great potential to transform all aspects of society's life through the introduction and integration of Information Communication Technologies (ICTs) such as mobile apps, among other technologies (Roza, 2020). The following parts reviewing the main study constructs and hypotheses in details.

2.1. Relationship and impact of users' perceived trustworthiness on attitudes towards GMAs use.

The trustworthiness within user's perception, called as subjective assessment or belief regarding the reliability, credibility, veracity and integrity is related to a person, the organization or the system (Ramli, 2020). This concept is crucial in the domain of technology and user experience, users expect the service providing a product, service or platform to guarantee the safety of their purposes. Users' loyalty to the website is not only concerned with the factors such as rationality but also emotions. It ranges from the transparency and consistency to the competence, benevolence, safety measures, privacy practices, and past experiences and social influences (Kurdi, Alshurideh, Salloum, et al., 2020a). However, it leads the formation of "user engagement" and user-based networks such as technology adoption, online market transactions and digital interface interactions (Shahzad et al., 2022). Companies work hard to create and establish users' felt conviction by practicing ethically, providing accurate and easy to understand information, dependable services and operation, strong security and responsive to the customer like this, they try to develop relationships that go far and promote satisfaction and loyalty that will be highly beneficial to the users in the end (Utomo et al., 2021). For instance, Masrury et al. (2019) and Shehada et al. (2018)in their studies stress that trust is the primary influence on the attitude of users towards government mobile apps. If users see the administration apps as solid or as the option they can count on in regard to security, privacy and reliability, approve will be more pronounced. However, apprehension regarding apps that are and those provided by government entities can lead to hurt feelings and the unwillingness of the general masses to use them. According to Lee & Ahmed (2021) certainly, privacy and security of customer data are essentially in building people's perception of digital trustworthiness. Individuals feel secure in using government mobile applications in the event of having guarantees that their personal information is well safeguarded and that the application follows the given privacy rules (Apaua & Lallie, 2022). Though, a lot is already done by the government services to increase the users' trust and positive attitude to the government apps, among others, the breach of users' privacy might be the reason for the turnabout. Huwari et al. (2023) emphasized on information disclosure and communication among users and government through mobile applications, one can see the criticality of such factor in building users' trust in government mobile apps. The direct and full disclosure of the app's operations, the features, data protection and the security measures could build users' trust (Alshurideh, 2024; Al Kurdi et al., 2025). The ease of use of such apps by governments and their openness with the users gains their trust and cause them to hold a positive attitude toward them (Cabeza-ram et al., 2022; Al Kurdi, 2024).

Citizens objectivity regarding the credibility and reliability of the government authorities also determines mobile apps trustworthiness. The Bodireddigari (2016) study pointed out that the confidence users develop towards the government agencies whose online presence becomes more reliable and credible in terms of services and information, results in more users considering the associated mobile apps as trustworthy. Someone could have a good experience with a service or interaction that went smoothly through a government app can indirectly influence trust in government and make people consider apps favorably (Alzoubi, 2020). Furthermore, the feature of peer assessment and category of the government agency significantly contribute to the user's perception about these apps. As AlKurdi et al. (2024) found out that positive feedbacks from referrals, friends, and from well-known sponsors can lead to the users perception of the government apps as honest and can consequently influence their convictions favorably.

Users concerns about safety, reliability, and personal data security of government apps is what they say impacts their confidence and as a result their attitudes towards it (Ramli, 2020; Vasudevan, 2024). The authentic brand images of trustworthiness will be linked to the admiring reviews that will be followed by positive attitudes, and increased intention to use the government mobile apps for many purposes (Kondrateva et al., 2020; Shaqrah et al., 2023). Privacy and data integrity were singled out as some of the crucial elements of winning public support for government applications by Habib et al. (2018). According to them, determine is deciding factor in that users perceptions are the foundation for the way they feel about the app's ability to protect their private information. The privacy issues as well as a question about data security can take away the trust and give a negative opinion of citizen's government app (Amponsah, 2024; Hamadneh, 2024; Almomani et al., 2025).

A study by Alzoubi (2020) focused on the purpose of transparency and dialogue that government mobile apps used for developing trust. They suggest that transparency through such features as data practices, safety and security measures, and communication regarding the app can boost perception of trustworthiness (Ozturk, 2024; Zahra, 2024). Apps approach by government that help in sort out user issues and supply detailed data are the key indication for developing positive attitude towards their apps (Lagos-Ortiz et al., 2020). Baker-Eveleth

& Stone (2020) discussed the influence of user perceptions of the government's efficiency and reliability on trust and attitudes toward mobile apps. They argue that a positive experience gained from services like mobile applications and interaction with government officials is what causes perception of trustworthiness to grow. Should the people be of the opinion that agencies are efficient and responsible, they will also tend to have trust in relevant mobile applications and create a good image of them. However, the humanities and reputation as a key determining factor in citizens attitudes towards government apps and whether they can be trusted or not. In this context, it is argued that favorable word-of-mouth and credible endorsements from people of high credibility can create great trust in others (Ma, 2021). Social networking as well as public reputation have a lot to do with the determination of the government pocket applications (Sharma et al., 2018). Based on the previous discussion, the influence of users' perceived trustworthiness on attitudes towards GMAs use can be drawn as:

H1: There is a positive effect of users' perceived trustworthiness on attitudes towards GMAs use.

2.2. Relationship and impact of users' perceived security on attitudes towards GMAs use.

Perceived security is generally defined as the perceived level of security held by one or more individuals/group of individuals as a result of security measures taken by an organization. It depends on the psychological factors, confidence in protective measures, as well as the general belief in safety measures implemented (Al-Busaidi, 2012). Despite the discrepancies between perceived security and real security, the former can be closer to the latter depending on the person's experiences, cultural background, and the available information (Apaua & Lallie, 2022). Perceived security directly affects users' trust and confidence in the GMAs platform. If users perceive the platform to be secure, they are more likely to trust it with their sensitive information and feel confident in using it for various purposes such as navigation, location-based services, or sharing personal data (Kanaan et al., 2023). Positive perceptions of security can increase users' attitude to adopt and use GMAs. Users are more likely to engage with and continue using a GMAs if they believe their data is protected from unauthorized access, misuse, or manipulation. Conversely, concerns about security may deter users from adopting or continuing to use GMAs. Users' perceived security influences their willingness to disclose personal information on GMAs (Balapour et al., 2020). When users feel that their data is adequately protected, they may be more willing to share location data, preferences, or other personal information to receive personalized services or recommendations from Security perceptions also impact user satisfaction with the GMA experience. Users who perceive the platform as secure are more likely to be satisfied with its performance, features, and overall usability. Conversely, security concerns can lead to dissatisfaction and frustration, potentially resulting in negative word-of-mouth or discontinuation of use. Users' perceptions of security affect their perceived risk associated with using GMAs (Denaputri & Usman, 2019). Higher perceived security reduces the perceived risk of privacy breaches, identity theft, or other security-related threats, leading to greater comfort and willingness to engage with the platform. Positive perceptions of security contribute to continued usage of GMAs over time (Balapour et al., 2020). Users who feel confident in the security measures implemented by the platform are more likely to remain loyal users and advocate for its use among their social circles.

According to the perceived security directly influences the users' trust and confidence when using government apps via mobile devices (Alzoubi, 2020). When users see an app as secure, then they will trust it with confidential data, and they will be confident in using it for many tasks. Users are appropriate to believe in, and accept, government mobile apps if they consider them secure. Security issues, such as data leaks or bugs, can prevent people from downloading and using such mobile apps. Implicit security encourages user experience enhancement with government mobile apps. Users who believe that their data is well protected are more than likely to be more satisfied with their experience in and out of the app. Utilization of government mobile apps by the users is governed by the perceived security of the users (Maqableh et al., 2021). It is clear that people's perception of security determines whether they are willing to reveal private information via government mobile apps. User will be most likely to input sensitive information only when they have trust that the app will not subject their data to unauthorized access or abuse (Habib et al., 2018). By this token, the security in the sight of the users also influences their decision to long-term use of government mobile apps. Apps that have the most perceived level of security have more of a chance to keep users and build on regular use (Nuseir et al., 2022). The security perception of users can lead them to recommend government mobile apps to others or not through their word-of-mouth. Good impressions of security will most likely get good recommendations, but bad impressions of security might get the feedback turned negative (Denaputri & Usman, 2019).

Alzoubi (2020) revealed that users' perceived security strongly influences their attitude of confidence they have on government mobile apps and acceptance. They emphasized the need of involving customers into security mechanisms and giving transparent details concerning data protection so as they can trust the system and use it. Al-Busaidi (2012) focused on the findings the correlation between perceptions of security and the intent to use government mobile apps. Users' perception of security has, therefore, been found to be highly significant in that it determines their behavioral attitude to use GMAs in seeking individual government services. As security concerns came up as a potential barrier to adoption it became obvious that cyber security must be one of the key priority areas for the businesses. Denaputri & Usman (2019) emphasized on whether the subjective sense of security is correlated to users satisfaction on GMAs. The researchers reported a very high positive relationship linking security level to user satisfaction, which is proof that a powerful negative influence is made by security concerns on user satisfaction with government mobile apps. Balapour et al. (2020) investigated the security element that determines users' attitude of revealing personal identification information through GMAs. The researchers observed that individuals tend to be more forthcoming when they feel reassured about the app's security, thus noting the critical role of meeting those needs in obtaining data and making quality services. Similarly, Nuseir et al. (2022) looked into the extent to which the sense of security has an impact on people's overall attitudes towards persisting in the use of GMAs. Users' representations of security in GMAs affect their intentions to stay

on with GMAs long-term. Trust is directly proportional to the security inherent in the government's mobile application—and this factor is a key determinant in the long-run commitment of users. Based on the previous discussion, the influence of users' perceived security on attitudes towards GMAs use can be drawn as:

H2: There is a positive effect of users' perceived security on attitudes towards GMAs use.

2.3. Relationship and impact of users' perceived quality on attitudes towards GMAs use.

The quality assessed by the target reliably points to the level of user satisfaction with the government mobile applications. User experience is highly influenced by the commitment of the app to offer the best quality in aspects of usability, robustness, reliability, and security (Alzoubi et al., 2020). If such aspects exhibit a high level of quality, the users will most likely be satisfied with their experience. On the other hand, poor ratings can result in irritation, frustration, and even dislike to the products by the customers (Alzoubi et al., 2020). Because the high quality is perceived therefore the trust and credibility are enhanced between the government mobile applications and people (Orehovački et al., 2022). The users are inclined to trust the apps only after they have figured that they are well-designed and functional and by maximum security. Users' perception of how biased or unsubstantial government mobile apps may be are considered among the major determinants of perceptions on uptake and sustained use thereof. Improved understandings of quality augment the possibilities of introducing the app in the first turn, though users have the inclination of downloading and trying these applications which they believe will be valuable and satisfying (Casare et al., 2024). The high level of perceived quality makes users want to be present and to keep coming back again and again for using the government's services – this long-term usage creates enduring relationships with the user. Those that employ government mobile phones that feel a high quality are more likely to suggest them to others . The fact that positive impression and recommendations are an essential part in the selling app and the attracting of new users cannot be overstated. On the contrary, unfavorable reviews about the quality of the apps may create a negative buzz in the market which may form a mental block in the minds of the possible users of the apps from ever trying to use the apps (Huerta-Álvarez et al., 2020). The level of quality which citizens see as the output of government initiatives which involves mobile apps affects the engagement of citizens and their participation in the government projects (Masrek et al., 2018). Well-crafted and intuitive smartphone apps attract users to interact with government services, to give their feedback and local activities like voting as well as filling in the surveys are also possible through due to the availability of key information and resources.

Users' perceptions about the government competence are made through their experiences with mobile apps. Standard apps have a significant effect on the people's description of government's knowledge to use technology to achieve its goals in terms of planning and implementation of government services (Baker-Eveleth & Stone, 2020). On the other hand, using substandard applications could be detrimental to public trust in digital governance, and people's belief in the government's ability to provide simple, straightforward, and user-friendly tech services (Wu & Chen, 2014). Thus, the efficiency of gov-app is critical and its impact on policy outcomes and government perception can be crucial (Alzoubi, 2020). The reinforcement of good user experiences with good quality apps can allow people to develop a more positive perception of government responsiveness, transparency, and accountability in addition to increasing trust in government institutions which, in turn, leads to a more satisfactory position of the citizens.

The quality perceptions influences how users relate with GMAs including trust and credibility. Apps that have high quality ratings are considered to be relying, trusted and believable, therefore, this builds the confidence of users to use them for government duties and requirements. The confidence the user has is related to the trust in the GMAs (Al Dmour et al., 2014). In simple terms, users get more comfortable with apps that feature seamless functionality, effortless navigation, and enhanced speed. Customer satisfaction increases when the app's quality better meet customer expectations thus leading to positive impression of the overall service provided (Ali et al., 2021). Users' opinions about the usefulness of GMAs are being shaped according to their general assumptions about the quality. Good apps are more valuable and efficient in doing government work related to services, accomplishing tasks on time, and getting target users in achieving their ultimate goals by these apps (Sharma et al., 2018).

The user experience becomes a factor of trust, loyalty, and commitment when it comes to grade management applications. Apps that are properly formed, react quickly, and with no crashed do not cause the negative user experience, leading to more pleasure and engagement with the app. Users' intentions to use GMAs will have an effect on quality (Zhou et al., 2020). Pleased users tend to offer persistent app usage in future with new types of communication with government offices or tasks. The users who believe that a particular round of GMAs is fragrant and nice are more likely to refer it to others (Ameen et al., 2020). Through favorable word-of-mouth and recommendations from known sources more people are getting to consider and use the GMAs later formation of a wider user base. Consumers' perceptions of the app's quality plays a part in the brand and reputation of the application. The image of the government as digitally empowered, citizens focused, and dedicated to offering efficient services is vastly improved by high-performance GMAs (Alzoubi et al., 2020) . Based on the previous discussion, the influence of users' perceived quality on attitudes towards GMAs use can be drawn as:

H3: There is a positive effect of users' perceived quality on attitudes towards GMA use.

2.4. Relationship and impact of users' perceived skills readiness on attitudes towards GMAs use.

User opinion on ease of use is a subjective and relative perception of skills readiness of the end user (Kanchanatanee et al., 2014). For instance, the ones that think they are competent and have the confidence in their operations are more likely to view the apps as easy to use.

In opposition to that, the ones that doubt their skills and their competence are more likely to perceive the app as challenging (Reddy et al., 2023). Skills assessment perceived as reliable by GMA users is in the center of their self confidence in adopting GMAs. Users who assure the sense of knowledge and readiness to navigate app become more confident and motivated in accomplishing tasks, and finally convinced that they are safe on using the GMAs (Alrwashdeh et al., 2020). Skills gaps in users perception on a System of GMAs would prevail in viewing the value gained from it. Individuals who feel ready for the apps may relate to the tools as something that can deliver the services and information on behalf of the government (Mohtar et al., 2022). On the other hand, persons who feel insufficiently prepared will be unconvinced about the benefits of the apps. The attitudes people hold towards using digital assistants are shaped to a great extent, by their confidence in the usefulness of such services. People who are convinced of their competencies tend to have positive perceptions, greater effectiveness in the application of green mitigation actions, whereas individuals who are less confident may show hesitancy and nerves (Hur et al., 2013). Also. one of the factors that shape the experience of learning with a gaming based medical application is the perceived level of skills readiness about the application (Shaqour et al., 2021). Feeling like you're more prepared will likely mean that you will start using them almost immediately and look out for extra functionalities and features. On the other hand, those who judge themselves as less ready may need additional help and assistance to overcome potential usability barriers. Targeting peoples' pointed skills readiness will help to fight digital gap by giving individuals the opportunity to learn the needed skills to use GMAs confidently, independently of digital literacy or technologically preparedness level. User's self-perceived skills define their requirement regarding training and support association to GMAs as well (Zhai, 2023). Customized training plans and user assistance materials can problematize the technical aspects associated with GMAs and help improve user capabilities (Abdolvand et al., 2008). Moreover, Al-Maroof et al. (2021a) investigated the influence of perceived skills readiness on attitudes towards GMA use among citizens. They found that users' confidence in their mobile technology skills positively affected their attitudes towards GMAs adoption. Users who perceived themselves as more skilled and ready to use mobile apps exhibited more positive attitudes and intentions towards GMAs use. Issaramanoros et al. (2018) explored the relationship between perceived skills readiness and attitudes towards GMAs use among university students. Their findings revealed that students with higher perceived skills readiness were more likely to have positive attitudes towards GMAs adoption for accessing academic and administrative services. Perceived skills readiness emerged as a significant predictor of students' willingness to use GMAs. Uluskan et al. (2018) examined the impact of perceived skills readiness on citizens' attitudes towards GMA use for accessing government services. They found that users' confidence in their mobile technology skills significantly influenced their attitudes towards GMAs adoption. Perceived skills readiness positively correlated with users' perceptions of the usefulness and ease of use of GMAs, leading to more favorable attitudes and intentions towards their use.

Shwedeh et al. (2022) investigated the role of perceived skills readiness in shaping attitudes towards GMAs use among older adults. They found that older adults who perceived themselves as more skilled and confident in using mobile technology were more likely to have positive attitudes towards GMAs adoption. Perceived skills readiness was identified as a key determinant of older adults' acceptance and willingness to use GMAs for accessing government services. Khan and Hussain (2022) explored the influence of perceived skills readiness on citizens' attitudes towards GMAs use in a developing country context. They found that users' confidence in their mobile technology skills positively impacted their attitudes towards GMAs adoption. Perceived skills readiness played a crucial role in shaping users' perceptions of the usefulness, ease of use, and trustworthiness of GMAs, leading to greater acceptance and intention to use (Alshurideh et al., 2019). Based on the previous discussion, the effect of users' perceived skills readiness on attitudes towards GMA use can be drawn as:

H4: There is a positive effect of users' perceived skills readiness on attitudes towards GMA use.

2.5. Relationship and impact of users' perceived usefulness on attitudes towards GMAs use.

Perceived usefulness is defined as the expectation that an individual has about the level of improvement in his or her work, efficiency, output, or satisfaction that could be attributed to the use of a specific technology product or service (Assaker, 2020). It is one of the constituents of technological acceptance models and depends on such factors as perceived usefulness, perceived ease of use and individual beliefs about the application of the particular technology (Ismail, 2016). People's belief in the efficacy of GMAs is the basis of their choice of the exact application to run and to use it. When the public perceive GMAs as effective means of having access to government services, information, and when the proceeds are done effectively, citizens are more inclined to have positive inclinations towards their adoption and use (Kurdi, Alshurideh, Salloum, et al., 2020b). The user's view of software app utility will influence the overall impression they have form GMAs. As.. The users who discover the apps feasible for them doing their governmental business and responsibilities will certainly be more satisfied with their overall interaction and have a higher chance of satisfaction. Users' opinion about the usefulness of GMAs, influences their opinion about the measurement of their fitness. If the GMAs (government mobile apps) prove to be useful for citizens in terms of efficiency, convenience, and access through these apps, then people perceive these apps as worthy investments of time and effort in pulling up the apps. Compared to many other types of fitness technology, GMAs are seen to be more helpful when people decide to go with them for an extended period of time (Pranata et al., 2013). As apps that deliver engaging and purposeful features regularly are likely to hold users and even stimulate their ongoing use. To add more, the extent users perceive GMAs as useful will impact their willingness to refer others' apps. Beneficial evaluations of utility create positive feedback, as they encourage recommendations so that there is sufficient adoption and use (Seesuk, 2020). The worthiness of GMAs has a significant role to play in the productivity and efficiency of service executions when undertaking governmental tasks. When these apps are seen as useful tools for saving time and resources, additional features are added and operating processes are streamlined, the morale of the users is lifted up as they feel that they are doing well at work

more often. Alhammadi & Alshurideh (2024) concentrated on the relationship between the perceived usefulness and citizens' inclination towards the usage of mobile applications channel for contacting government services. The result indicated that users' perceptions of the benefit of GMA determined their attitudes and purpose to adopt the given technology. Usefulness was determined as the most contributing factor in making favorable attitude to GMA application. Seesuk (2020) testified the effect of subjective usefulness on GMAs acceptance by citizens as an attitude. Such research facilitated them to establish a strong positive correlation between usefulness and existing attitudes toward GMAs use. People with GMAs who find them useful for getting government services or information demonstrated their more favorable views and aims for adopting them. Also, the study of Al-Maroof et al. (2021b) addressed the question of whether perceived usefulness might determine the residents' positive or negative attitude to the use of GMA for e-government services. Their research discovered that users' perceptions on the usefulness of GMAs significantly added to the positive attitudes and adoption intentions. It is usefulness perceived value that is the main determinant of citizens' willingness to use GMAs for access of government services. Ventre & Kolbe (2020) investigated the connection between perceived usefulness and students' attitude towards the application of GMA at the university. Their faculty showed that there was a correlation between students' perceptions related to the usefulness of GMAs. The use of GMAs was found to be largely driven by a student's perception of usefulness, which in turn determined their attitudes and intentions towards using GMA tools. To clarify, implementing an empirical analysis of the use of GMA for electronic government operations, it considered a clear positive correlation between subjective importance and the attitudes toward GMA adoption. It is, therefore, clear that perceived effectiveness is the key to creating proper attitudes which subsequent lead to adopting. (Ohk et al., 2015) observed that peoples' attitudes towards GMA use for obtaining services from their government is considerably affecting whether or not people have positive attitudes towards it. However, it was clear that usefulness factor was an obvious key determinant that shaped peoples' perception. Respondents express gratitude for GMA as a means of getting the government information and services and they arise high rate of attitudes towards practicing GMA (Caffaro et al., 2020). Thus, it is clear that perceived usefulness target attitudes. Additionally, Theory of Technology Acceptance Model (TAM) spotlight that users' opinion of the usefulness emerging technologies in general and such specific as mobile apps have a primary factor contributing to the adopting behavior (Alshurideh et al., 2019). It turned out that residents usually utilize the mobile applications more frequently in case they consider that these governmental websites assist them in search processes and access to information. Denaputri & Usman (2019) studied the correlation between subjective usefulness and their appraisal of using GMA among university scholars. Their investigation concluded that the level of usefulness students have perceived towards these types of aids is also one of the reasons why they are attracted to the technology. The perceived usefulness proved paramount in positive students' attitudes and intentions as regards the implementation of GMA (Ventre & Kolbe, 2020). Based on the previous discussion, the influence of users' perceived usefulness on attitudes towards GMAs use can be drawn as:

H5: There is a positive effect of users' perceived usefulness on attitudes towards GMAs use.

2.6. Relationship and impact of users' perceived ease-of-use on attitudes towards GMAs use.

Perceived ease-of-use is a major predisposing point that determines the attitude of users towards adopting technology (Al-Maroof, Alhumaid, et al., 2021). TAM studies conducted whenever general technology is employed usually reveal people who perceive GMAs to be easy to use have better attitudes towards their adoption and usage as compared to those who see them as difficult thus discouraging their acquisition (Ma, 2021). The Unified Theory of Acceptance and Use of Technology (UTAUT) framework merges into one evaluation of the many different factors that influence technology acceptance, the simplification of which being the most important (Singh et al., 2020). The application of the UTAUT research to GMAs proves that various aspects of ease-of-operations considerably enhance or degrade attitudes towards the adoption of, and the use of, GMAs by users (Yang et al., 2022). Studies that point to e-government's service quality discussion generally have in their conversation how convenience has a determining role in shaping citizens attitude toward using GMAs (Lean et al., 2009). Individuals who take GMAs processes as the simplest ways of using government services are more likely to be have a favorable points of view on such processes. According to Task-Technology Fit (TTF) theory, users form their opinions on a new class of devices such as GMAs depending on their feelings regarding the compatibility of a technology (the new equipment itself) with their tasks (Lee & Chen, 2022). References to TTF theory in research concerning GMAs indicate that the perception of an application's convenience becomes a basic greenfield for a user's positive attitude towards this application for government related activity (Lee & Chen, 2022). Further, research on user experience shows that predicted ease-of-use has a relation with attitudes towards a technology and another positive one is general media acceptance (Alzoubi, 2020). User experiences that are positive, characterized by fast response time and understood interfaces, low cognitive load and browsing comfort from the consumer side, lead to the consumer's more positive brand perception (Taba et al., 2014). In their research on the Unified Theory of Acceptance and Use of Technology (UTAUT) model, Gao & Yang (2015) addressed the impact of perceived ease-of-use on the attitude to use technology including GMAs. The team discovered that people with strong beliefs that GMAs are user-friendly tend to be more open to using this technology. Also, it was observed that participants who thought that the GMAs were easy to use for receiving government services had more positive perceptions about using them (Sharma et al., 2018). The study shows users who find GMAs easy to use rate them favorably and increase their adoption and use. Lu et al. (2022) studied the relationship between perceived ease of use and attitudes of university students toward the use of GMAs. The researchers established that students' perceptions of the ease of using GMAs significantly impact their attitudes towards adoption. Students' attitude toward GMAs use was largely determined by perceived ease of use. Based on the previous discussion, the influence of users' perceived ease-of-use on attitudes towards GMAs use can be drawn as:

H6: There is a positive effect of users' perceived ease-of-use on attitudes towards GMAs use.

2.7. Relationship and impact of users' perceived effort expectancy on attitudes towards GMAs use.

In this study, perceived effort expectancy is defined as the extent to which an individual believes that using a specific technology or a system would be easy or difficult. As part of perceived ease of use in the Technology Acceptance Model (TAM), Tannady et al. (2024) argued that the perceived level of ease plays a crucial role on how users will perceive systems, their intentions, as well as how they will adopt and utilize the technology. Perceived effort expectancy addresses is the perceived amount of effort it takes to use a particular system, the number of steps that are followed, the time spent to complete tasks, and the overall satisfaction level of the end-user in the process (Seesuk, 2020). High perceived technology for effort implies that users perceive a certain technology as complex to use while low perceived technology for effort suggests that users have the impression that a particular technology is not difficult to use and does not require a lot of effort (Sair & Danish, 2018). Moreover, high perceived effort expectancy indicates that users perceive a technology as difficult to use, while low perceived effort expectancy suggests that users perceive the technology as easy to use and requiring minimal effort. Perceived effort expectancy, as a component of ease of use, plays a crucial role in shaping users' perceptions and behaviors regarding technology adoption (Do Nam Hung et al., 2019). Numerous studies have supported the significance of perceived effort expectancy in influencing users' attitudes towards various technologies, including mobile applications (Kapoor & Singh, 2020). When the analysis is oriented towards GMAs, the concept of perceived effort expectancy emerged as the recurrent variable while developing the model portraying how users perceive and plan to use the applications. For instance, the study conducted by Alshehri and Drew (2010) revealed that perceived ease of using the government mobile apps by the target end-users had the data effect of attitudes towards such applications. As in this research, Utomo et al. (2021) in their study on mobile government services' adoption found perceived effort expectancy as predicting users' attitude towards using GMAs. Based on the previous discussion, the influence of users' perceived effort expectancy on attitudes towards GMA use can be drawn as:

H7: There is a positive effect of users' perceived effort expectancy on attitudes towards GMAs use.

2.8. Relationship and impact of users' attitude towards GMAs use on their GMAs actual use.

Musa et al. (2016) proved that the attitudes of users about the government mobile applications (GMAs) has been covered in depth for understanding the actual usage of those applications and important finding about adoption behavior and engagement pattern has been presented. Studies over the years have further supported the notion that a positive attitude must be followed by enhanced usage of GMAs (Belanche et al., 2020). The perceived determinants for attitudes toward the use of the mentioned media relate to perceived usefulness, ease of use, perceived government entities, and perceived satisfaction in service delivery through GMAs. Furthermore, research noted that the demographics of users contribute to the usage of technology; the age, education level, and technology experience mediate the correlation between the attitude towards the technology and the realistic utilization (Khai Loon et al., 2018). Implications for practice arising from these findings are that the usability of GMAs needs to be maximized, and that ensuring the security of their application, while also paying attention to the needs of users. Promoting positive attitudes and enhancing the users' sustained engagement is also attributable to communicating the benefits of GMAs, categorically, and promoting a culture of change based on the users' feedback (Kanchanatanee et al., 2014). In summary, it could be concluded that the analysis of users' perceptions of GMAs is vital for the promotion of their use effectively and the effectiveness of the governmental digital strategies.

Several researches confirm the fact that positive attitudes towards GMAs increase the represented users actual intention to employ these applications (Alzoubi, 2020). This positive working attitude is dependent on factors such as perceived usefulness, perceived ease of use, trust in government service and perceived satisfaction in prior studies. Looking at the theoretical models such as TAM or UTAUT, one sees that attitude serves as key enabler of the subsequent behavioral intention construct which, in turn, is a major antecedent of actual usage behaviors (Zhou et al., 2020). The implications derived from such research findings include; the significance of adopting user-oriented approach in designing GMAs, the necessity of users being well-informed on the value of using mobile applications, the need to incorporate user feedback to enhance GMAs design, and the need to establish user confidence on the government digital services to reinforce the intent and usage of mobile applications (Alshurideh et al., 2012). In sum it is vital to understand and manage the users' attitudes towards GMAs so as to make greater use of them and also ensure that the delivery of government services is enhanced through m-governance. Based on the previous discussion the hypothesis can be drawn as:

H8: There is a positive effect of users' attitude towards GMAs use on their GMAs actual use.

2.9. Relationship and impact GMAs actual use on users' happiness.

The influence of government mobile applications (GMAs) on users' level of happiness has come to be thought of as an area of interest that has drawn a lot of attention from scholars, who are interested in the effects of technology on well-being (Zhou et al., 2020). Consequently, several researchers and pieces of literature have endeavored to examine the effect of the actual use of GMAs on the respondents' level of happiness and satisfaction with government services (Ramli & Rahmawati, 2020). Based on these studies, it was found that when the supply of the GMAs is utilized properly, users have greater convenience, increased efficiency, and easy access to public services that positively impacts their happiness index (Lagos-Ortiz et al., 2020). For example, use of GMAs that facilitate ease of acquiring information and engaging government agencies may reduce the stress and frustration that comes with business as usual or over formalized approaches to service delivery (Alsheikh, 2020). In addition, the nature of being able to access information and response directly through GMAs often enhances user satisfaction as they are given a charge to be responsible citizens. Kumar (2021) propose that perceived usefulness and the perceived ease of use are two factors that have significant impacts on satisfaction, and hence, they contributed

to happiness. Additionally, research also points out the aspects of trust and transparency with regard to government dealings enabled through GMAs that makes users more comfortable and improves satisfaction (Zaid & Patwayati, 2021). The presented ideas have to be seen as a reminder of the necessity to constantly develop new designs, refine GMAs user experience, and promote the value that users expect, in order to improve happiness results in long term. It should be mentioned that the relation between GMAs and happiness is rather complex and depends on many factors; still, the analysis of the available research indicates that properly developed and efficiently utilized GMAs can help improve overall satisfaction and wellbeing of users in terms of public services (Hur et al., 2013). Based on the previous discussion the hypothesis can be drawn as:

H9: There is a positive effect of GMAs actual use on users' happiness.

All the study constructs and interrelated proposed relationships have been drawn as shown in the study model figure 1.
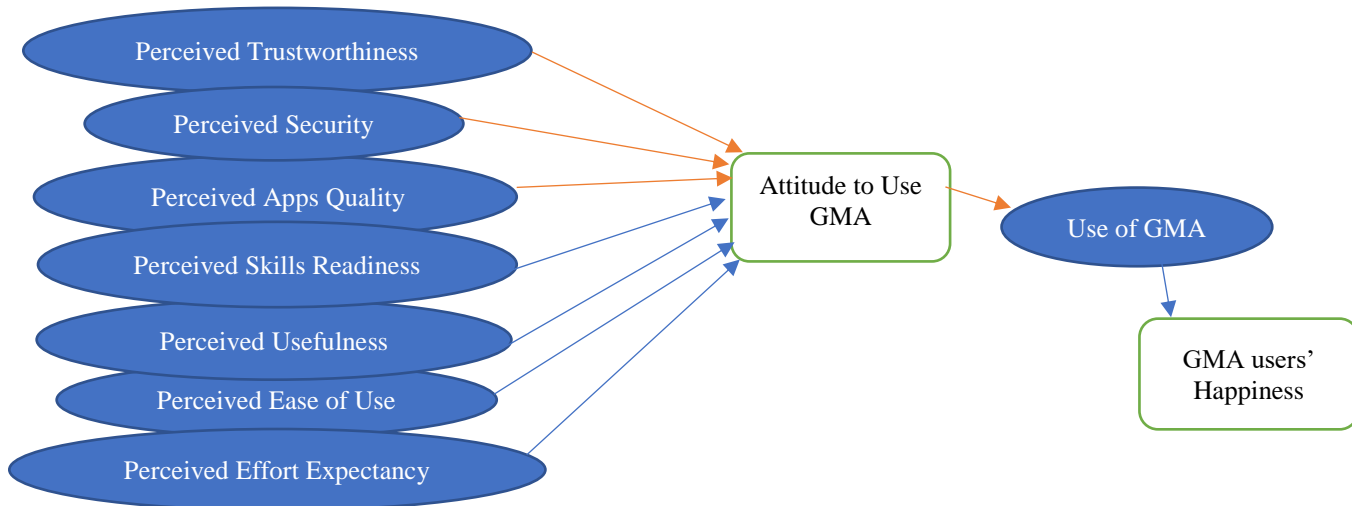
2.4. Research model

Figure 1. Conceptual Framework

2.5. Study hypotheses

Based on the study model. A set of hypotheses can be suggested as:
H1: There is a positive effect of users' perceived trustworthiness on attitudes towards GMAs use.
H2: There is a positive effect of users' perceived security on attitudes towards GMAs use.
H3: There is a positive effect of users' perceived quality on attitudes towards GMAs use.
H4: There is a positive effect of users' perceived skills readiness on attitudes towards GMAs use.
H5: There is a positive effect of users' perceived usefulness on attitudes towards GMAs use.
H6: There is a positive effect of users' perceived ease-of-use on attitudes towards GMAs use.
H7: There is a positive effect of users' perceived effort expectancy on attitudes towards GMAs use.
H8: There is a positive effect of users' attitude towards GMAs use on their GMAs actual use.
H9: There is a positive effect of GMAs actual use on users' happiness.

3. METHODOLOGY

3.1 Construct development for research model

The study utilized a quantitative research technique using descriptive, exploratory, causal, and analytical approach to obtain objective data to measure predetermine factors affecting users' happiness who use Ministry of Interior (MOI) app in the UAE. For data collection, the study employed quantitative surveys to collect data on how users' perceived trustworthiness, perceived quality, perceived effort expectancy, perceived app quality, perceived usefulness, perceived ease of use, perceived skills readiness, and perceived security affect their behavioral intentions and attitude towards GMAs use and predict GMAs users' happiness. The thesis employed the quantitative approach in a purpose to collect data from a wide range of users (Bougie & Sekaran, 2019) in order to check the output of use terms such as happiness. Using a quantitative method is a good approach to collect data from exploratory point of view especially when such governmental mobile service is already used but lack the study investigate it. This method is widely used in similar studies such as mobile applications (De Reuver et al., 2016).

3.1.1 Study Population and Sample

The study population contained government mobile application customers residing in the UAE. They are one of the principal age associates who are deeply immersed into digital services operated by the government thus, it symbolizes the contribute of technology and e-

governance into the nation. In order to obtain necessary information, questionnaires were distributed. The number of questionnaires for the study received with 477 valid responses, out of the 521. The response rate is estimated by dividing the number of respondents who actually completed the survey by the total issued questionnaires, which is 521, and the result of which is 477, the response rate is 91.5%. Such high response rate imply active participation of the participants making the study more reliable and representative in terms of result generation. This sample size was employed in the study for model validation, reliability testing as well as hypothesis testing regarding the designed model. The research provided an in-depth analysis of the various aspects of the digital services of the UAE government specifically provided by MOI that are aimed at improving the usability, performance, and quality of these services for the residents. The research applied random sampling, which involved the use of probabilistic sampling procedure during participant recruitment. One of the potential advantages of random sampling was that there are no requirements for the researcher to know the structure and characteristics of the study population beforehand. Further, a random sampling technique ensured that each person or unit in the target population has a fair chance of recruitment to participate in the survey (Jawale, 2012). The minimum requirement for participation was that each case in the target population must be a resident or a citizen in any of the Emirates in the UAE.

3.1.3 Data Collection

At the start, the authors administered a detailed web-based questionnaire to each participant upon meeting the minimum requirements for inclusion. One of the key benefits of using web-based questionnaires was they result in a high response rate and do not require much time to collect data. The questionnaire undergo pre-testing (pilot study was about 10% of the total sample) procedures before its actual application for the data collection on the sample population. Pre-testing entailed subjecting the questionnaire to expert reviews to assess its effectiveness and spot any problems, potential breakdowns and errors in the question answering process (Ikart, 2019). Pre-testing helped to evaluate the validity and reliability of the questionnaire and its effectiveness in measuring research objectives (Ikart, 2019). Performing sufficient pre-tests on the research instrument allowed the researcher to revise some of the questions to improve comprehensibility such as the items adopted from (Thaneshan, 2021) to measure intention to use GMAs were revised according to targeted population. Moreover, the survey ethical approval to collect the needed data was taken from the ethical approval committee.

3.1.4 Questionnaire Development

Development of a questionnaire to investigate Intention, attitude and usage behavior toward UAE Government Mobile Apps (GMA) concerning user happiness to the contexts of TAM involves creating questions that measures comprehensiveness of extended TAM factors-perceived ease of use, perceived usefulness, Perceived Trustworthiness , Perceived Security, Perceived Quality , Perceived Skills Readiness, Perceived Effort Expectancy, attitude ,intention and use toward happiness. It also looks at how a set of these factors affect user happiness as identified by the questionnaire. Objective questions that concern the actual usage behaviors include Likert-scale items for assessing attitudes and intentions, and frequency or duration for app usage. A Likert scale provided a high degree of internal consistency in quantitative measurements (Alshurideh et al., 2021). The anchors ranged from 1 to 5 for each item where 1=strongly disagree to 5=strongly agree (Alshurideh et al., 2021).

3.1.5. Construct Measurement

In this thesis, all constructs were measures from the scales developed in previous research and modified to fit in the UAE Government Mobile Apps (GMA) context. The intention to use GMA, was established with items from Thaneshan (2021) that evaluates the users' perceived behavioral intention to use or maintain their usage of the technology in the future. The level of GMA use was assessed based on the frequency of app usage by the respondents, and adopted the item from (Alshurideh et al., 2019). User happiness of GMA was assessed using items from the user experience and satisfaction studies (Hills & Argyle, 2002). Attitude to use was measured using items from (Thaneshan 2021). In the same way, the perceived ease of use Olivia & Marchyta (2022) and perceived usefulness which are fundamental to the TAM were also measured in order to evaluate how users perceive the usability of the app and the advantages of using it (Olivia & Marchyta 2022). Also, perceived trustworthiness was adapted from previous studies by Gokmenoglu & Amir (2021). Perceived security was assessed by items from (Wong & Mo, 2019). Perceived quality was assessed based on items by (Jaradat, et al. 2018). Perceived skills readiness was adapted from (Insorio, 2021), which measure users' confidence in their ability to use the app effectively. Finally, perceived effort expectancy derived from (Fedorko et al., 2021), was used to measure users' perception of the app's ease of use, particularly how much effort they believe is required to interact with the system. Each construct was modified to reflect the unique aspects of government mobile apps in the UAE, ensuring that the items were contextually relevant while maintaining consistency with existing measurement scales.

3.1.6. Statistical Tools for Analysis

The research used the statistical package for social sciences (SPSS) to calculate descriptive statistics, such as correlation, reliability and regression. The researcher utilized one of the advanced statistical methods such as the Analysis of Moment Structures software (AMOS) to perform Structural Equation Modeling (SEM) or Smart-PLS.

4. DATA ANALYSIS

Current research endeavor completed the data analysis by deploying the usage of two different statistical applications named as SmartPLS 3 and SPSS 27. This has been a quantitative study which was aimed at investigating the determinants use and happiness of government mobile applications (GMA) provided by the ministry of interiors (MOI) to the residents and citizens of UAE. Data was collected from the

GMAs specifically MOI application users across all seven emirates i.e., Abu Dhabi, Dubai, Sharjah, Ajman, Umm Al Quwain, Ras Al Khaimah and Al Fujairah. Data was analyzed based on 477 valid responses to obtain insights from the diverse relationships among the study variables.

4.1. Demographics

Demographic data tells the readers how different groups vary from each other based on specific study variables (Sekaran, 2003), such as gender, education, and job experience. The following section gives details about the demographics used in this study. The distribution of gender characteristics of demographics indicates that there were 162 females (34%) and 315 males (66%). Which suggests that males make up the majority in this group. Regarding the age groups, it reveals that most people are aged between 31-40 years (n = 239, 50.1%), followed by 41-50 years (n = 132, 27.7%), and under 30 years (n = 62, 13%). The smallest group consists of respondents aged between 51-60 years (n = 42, 8.8%) and over 60 years (n = 2, 0.4%). Regarding the educational qualification, it shows that most either had a Bachelor's degree (n = 226, 47.4%) or a Master's degree (n = 208, 43.6%). A smaller percentage held a High School qualification (n = 23, 4.8%), while those with Doctorate degree made up the smallest portion (n = 20, 4.2%). Regarding the organization type, results show that most of them are employed in Federal-Government organizations (n = 151, 31.7%), followed by Local-Government (n = 124, 26%), Ministry (n = 113, 23.7%), and Others (n = 89, 18.7%). By addressing the respondents' living cities, results show that how the participants are dispersed geographically across UAE. Dubai (n = 162, 34.0%) has the highest number of participants among the surveyed population. Abu Dhabi (n = 128, 26.8%) being the capital of UAE holds the second largest share. Sharjah (n = 117, 24.5%) is close to the percentage of Abu Dhabi suggesting that it is also a major hub. Sharjah's significant percentage might indicate a thriving middle-class population using the GMAs a lot. Followed by Ajman (n = 27, 5.7%), Ras Al Khaimah (n = 22, 4.6%), Al Fujairah (n = 14, 2.9%), and Umm Al Quwain (n = 7, 1.5%).

4.2. Correlational statistic

This analysis offers important insights into how well the variables are related to each other, namely the type of linear relationships present among them (Sekaran, 2003). To evaluate that how these variables correlate, Pearson correlations were calculated and can be reviewed in Table 1. As it can be seen from Table 1 that all the correlations among hypothesized/modelled variables were positive and significant ($p < .05$), indicating they all were connected with each other in the expected way. AGMA also showed a significantly positive correlation with PT (r = .436, $p < .01$), PS (r = .192, $p < .01$), PQ (r = .540, $p < .01$), PSR (r = .499, $p < .01$), PU (r = .436, $p < .01$), PEOU (r = .493, $p < .01$) and PEE (r = .489, $p < .01$). Finally, GMAUH had a positive and significant relationship with UGMA (r = .510, $p < .01$).

Table 1. Correlations

Variable	PT	PS	PQ	PSR	PU	PEOU	PEE	IGMA	AGMA	UGMA	GMAUH
PT	1										
PS	.086	1									
PQ	.409**	.020	1								
PSR	.490**	.027	.475**	1							
PU	.284**	.052	.429**	.362**	1						
PEOU	.370**	.020	.452**	.480**	.314**	1					
PEE	.364**	.039	.517**	.446**	.425**	.435**	1				
IGMA	.399**	.161**	.482**	.447**	.373**	.436**	.452**	1			
AGMA	.436**	.192**	.540**	.499**	.436**	.493**	.489**	.652**	1		
UGMA	.408**	.030	.449**	.483**	.404**	.384**	.445**	.356**	.398**	1	
GMAUH	.332**	.049	.447**	.437**	.383**	.422**	.477**	.325**	.379**	.510**	1
*N = 477, ** = p < .01*											

4.3. Measurement model assessment

4.3.1. Common Method Bias

When evaluating the effectiveness of measurement model, this study made sure that it remained unaffected by issues like path contamination and collinearity, which can often distort results. Following Hair et al. (2019), this study assessed the model's robustness by ensuring that Variance Inflation Factor (VIF) values stayed below 3. This indicates the absence of multicollinearity concerns, reinforcing the reliability of our model. With VIF values not exceeding the threshold of 3.3, it can be confident in the minimal risk of common method bias, lending additional credibility to the study findings. Also, results provides a clear view of the model's standing regarding these critical calculations. Table 3 reveals that collinearity and common method bias were clearly ruled out, further attesting to the model's quality and reliability. The model's independence from path contamination, collinearity, and common method bias significantly contributes to its credibility, instilling researchers' confidence in the precision of its forecasts and interpretations.

4.3.2. Measurement Model

To understand the measurement model or outer model while using Partial Least Squares Structural Equation Modeling (PLS-SEM), it's crucial to assess the constructs' reliability and validity. This process involves examining several aspects, including indicator reliability, composite reliability (CR), and average variance extracted (AVE) essential to confirm the constructs' convergent validity. Additionally, assessing discriminant validity through Heterotrait-Monotrait HTMT ratios and the predictive relevance of the model are integral parts of

this comprehensive assessment (Hair et al., 2019). In this study, the assessment of the constructs, such as PT, PS, PQ, PSR, PU, PEOU, PEE, AGMA, UGMA and GMAUH, was precisely carried out using SmartPLS.

4.3.3. Indicator Reliability

The first and most critical criterion assessed was the reliability of the indicators of the measurement model. Within this assessment, individual indicator reliability played a crucial role. Indicator reliability involves inspecting the factor loadings of all indicators, indicating the strength of association between the indicators and the construct. Higher factor loadings suggest stronger relationships, representing greater reliability. Typically, a measure is considered reliable when its factor loadings exceed 0.50 (Hair et al., 2019). In this study, all scale factor loadings surpassed 0.70, as detailed in Table 2 and Figure 2, ensuring the reliability of all indicators.

Table 2. Factor Loadings

Indicators	PT	PS	PQ	PSR	PU	PEOU	PEE	AGMA	UGMA	GMAUH
PT1	0.853									
PT2	0.854									
PT3	0.852									
PT4	0.864									
PT5	0.812									
PS1		0.703								
PS2		0.880								
PS3		0.865								
PS4		0.877								
PS5		0.872								
PQ1			0.895							
PQ2			0.874							
PQ3			0.900							
PQ4			0.893							
PQ5			0.827							
PSR1				0.883						
PSR2				0.880						
PSR3				0.916						
PSR4				0.914						
PSR5				0.892						
PSR6				0.764						
PU1					0.871					
PU2					0.869					
PU3					0.830					
PU4					0.896					
PU5					0.788					
PEOU1						0.780				
PEOU2						0.892				
PEOU3						0.842				
PEOU4						0.882				
PEOU5						0.873				
PEOU6						0.733				
PEE1							0.838			
PEE2							0.846			
PEE3							0.882			
PEE4							0.893			
PEE5							0.933			
PEE6							0.919			
AGMA1								0.829		
AGMA2								0.802		
AGMA3								0.930		
AGMA4								0.876		
AGMA5								0.943		
AGMA6								0.937		
UGMA1									0.888	
UGMA2									0.926	
UGMA3									0.840	
UGMA4									0.893	
UGMA5									0.942	
UGMA6									0.932	
GMAUH1										0.896

GMAUH2										0.916
GMAUH3										0.868
GMAUH4										0.908
GMAUH5										0.900

4.4.4. Internal Consistency

The second step in assessing the measurement model involved checking the Cronbach's alpha values, which evaluates how consistently a set of items measures a single concept. This test helps in determining whether the instrument items are closely related with each other or not, acting as a measure of the scale's reliability. The rule of thumb is that a Cronbach's alpha value should be above 0.7 to indicate good reliability (Hair et al., 2019). In this study, the Cronbach's alpha for all variables in the statistical model clearly are more than 90% as shown in Table 3.

4.3.5. Composite Reliability (CR)

As a third criterion for assessing the measurement model of this study, Composite Reliability (CR) was examined to check the internal consistency and stability of the modelled variables. CR provides insights into how steadily the indicators of each construct measure the fundamental concept, higher CR values indicate better internal consistency leading to higher reliability of the construct. Moreover, Cronbach's alpha can sometimes underestimate the true reliability, thus CR serves as an essential alternative measure for a more robust estimation of reliability. According to Table 3, the measurement model in this study achieved acceptable CR values (> 0.7) for confirmatory purposes (Hair et al., 2019), which further reinforced the overall reliability of the model.
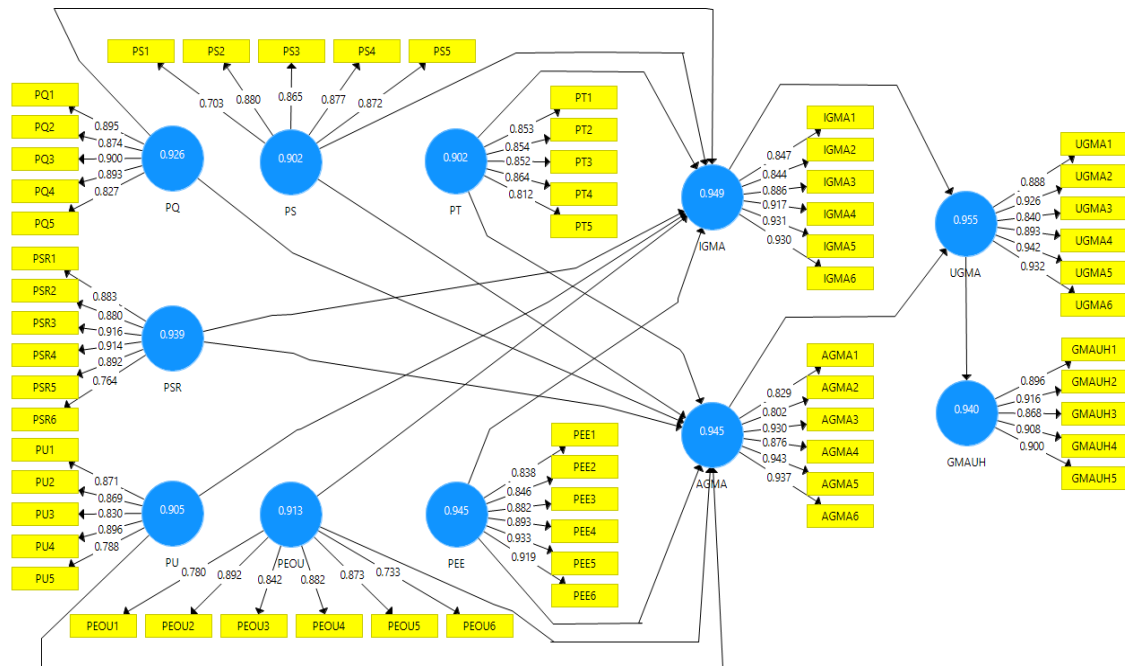

Figure 2 . Measurement Model

4.3.6. Convergent Validity

The fourth criterion utilized to determine that if the measurement model fitted well was the evaluation of convergent validity. Convergent validity refers to how well the indicators within a construct measure the same fundamental concept, principally assessing how closely a measure relates to or differs from other items within the same variable. It reflects the extent to which an item positively relates to other items of the same variable. Average Variance Extracted (AVE) served as the metric for assessing convergent validity. A higher AVE value signifies a stronger convergence among the indicators, thus representing higher convergent validity. Typically, for convergent validity to be established, the AVE should exceed 0.5 (Hair et al., 2019). As depicted in Table 3, the AVE values straightforwardly exceeded this defined criterion, confirming the convergent validity of all study constructs.

Table 3. Reliability, Validity and Quality of the Measurement Model

Variable	CA	CR	AVE	H^2
AGMA	0.945	0.957	0.788	0.699
GMAUH	0.940	0.954	0.806	0.698
PEE	0.945	0.956	0.785	0.693
PEOU	0.913	0.933	0.698	0.578
PQ	0.926	0.944	0.771	0.648
PS	0.902	0.924	0.709	0.568

PSR	0.939	0.952	0.768	0.674
PT	0.902	0.927	0.718	0.570
PU	0.905	0.929	0.725	0.582
UGMA	0.955	0.964	0.818	0.739

4.3.7. Predictive Capacity (H²)

The fifth criterion used to establish the quality of the measurement model was its capability to demonstrate prediction quality through the evaluation of predictive capacity. Predictive capacity is model's capability to correctly guess the future outcomes or behaviors based on the examined variables, which offers insights into its effectiveness in making dependable predictions. Evaluating predictive validity convoluted calculating the values of communality (H^2) for each block within the measurement model. Communality mirrors the common variance between the observed indicators and the latent construct they belong to. Positive H^2 values indicate an open and sizable relationship between the indicators and the underlying construct. As given in Table 3, the results reveal that all H^2 values across blocks of measurement model were positive, which complemented the predictive capacity. This means that the indicators within each block contributed meaningfully to predict their relevant latent constructs they were part of (Shmueli et al., 2019).

4.3.8. Discriminant Validity

The final step considered to assess the adequacy of the measurement model was discriminant validity, which gauges how distinct one latent construct is from others within the model. This analysis evaluates how well each construct differs from others, ensuring that the items of a construct are more strongly related to their own construct than to others In this study, discriminant validity was confirmed based on Heterotrait Monotrait HTMT criteria of < 0.85. The data in Table 4 shows that all HTMT values meet the necessary standard. Consequently, it was concluded that all constructs exhibited sufficient discriminant validity (Hair et al., 2019).

Table 4. Discriminant Validity of the Measurement Model – HTMT

Variable	AGMA	GMAUH	IGMA	PEE	PEOU	PQ	PS	PSR	PT	PU
AGMA										
GMAUH	0.402									
IGMA	0.689	0.345								
PEE	0.517	0.505	0.477							
PEOU	0.530	0.455	0.468	0.468						
PQ	0.577	0.479	0.513	0.553	0.492					
PS	0.175	0.075	0.152	0.071	0.075	0.088				
PSR	0.531	0.465	0.474	0.474	0.519	0.510	0.081			
PT	0.472	0.360	0.431	0.394	0.408	0.447	0.123	0.533		
PU	0.472	0.414	0.402	0.459	0.345	0.469	0.063	0.394	0.315	
UGMA	0.420	0.538	0.375	0.469	0.412	0.477	0.089	0.510	0.441	0.434

Additional method to check if different concepts measured in the study are truly distinct involves comparing the square of the Average Variance Extracted (AVE) for each variable against the correlations between variables, a method known as the Fornell-Larcker criterion (Fornell & Larcker, 1981). For discriminant validity to be confirmed, these squared AVE values should be higher than the corresponding correlations between the variables. According to Table 5, this requirement was generally met in this study, ensuring the discriminant validity of most variables.

Table 5. Discriminant Validity of the Measurement Model – Forenell-Larker

Variable	AGMA	GMAUH	IGMA	PEE	PEOU	PQ	PS	PSR	PT	PU	UGMA
AGMA	*0.888*										
GMAUH	0.379	*0.898*									
IGMA	0.652	0.326	*0.893*								
PEE	0.490	0.476	0.453	*0.886*							
PEOU	0.499	0.425	0.439	0.439	*0.836*						
PQ	0.541	0.446	0.482	0.517	0.457	*0.878*					
PS	0.179	0.073	0.154	0.071	0.073	0.085	*0.842*				
PSR	0.504	0.439	0.450	0.447	0.482	0.476	0.079	*0.876*			
PT	0.437	0.333	0.401	0.367	0.370	0.410	0.115	0.489	*0.848*		

PU	0.437	0.383	0.374	0.423	0.320	0.429	0.058	0.367	0.286	*0.852*	
UGMA	0.400	0.510	0.357	0.445	0.384	0.448	0.095	0.483	0.409	0.401	*0.904*

Another method which also establishes the discriminant validity of the measurement model is the assessment of the cross loadings. The principal behind this method is that factor loading of any variable should be at 0.2 margin ahead on the least to assume that it's native to its principal factor but native to other factor it may have some correlation with (Hair et al., 2019). As shown in Table 6 that all the factor loadings in bold and italic font are large enough from other loadings, thus ensuring that discriminant validity by this method was also eminent.

Table 6. Discriminant Validity of the Measurement Model – Cross Loading Method

Variable	AGMA	GMAUH	IGMA	PEE	PEOU	PQ	PS	PSR	PT	PU	UGMA
AGMA1	*0.829*	0.326	0.578	0.457	0.427	0.476	0.178	0.446	0.375	0.407	0.349
AGMA2	*0.802*	0.323	0.558	0.403	0.413	0.440	0.165	0.435	0.369	0.349	0.374
AGMA3	*0.930*	0.346	0.574	0.431	0.462	0.487	0.155	0.450	0.405	0.378	0.354
AGMA4	*0.876*	0.319	0.599	0.435	0.429	0.485	0.143	0.422	0.395	0.372	0.325
AGMA5	*0.943*	0.345	0.582	0.441	0.457	0.495	0.152	0.461	0.389	0.394	0.360
AGMA6	*0.937*	0.354	0.581	0.441	0.468	0.495	0.159	0.470	0.391	0.422	0.366
GMAUH1	0.351	*0.896*	0.289	0.404	0.385	0.429	0.063	0.410	0.328	0.359	0.461
GMAUH2	0.327	*0.916*	0.290	0.431	0.386	0.399	0.055	0.367	0.285	0.324	0.456
GMAUH3	0.348	*0.868*	0.280	0.440	0.373	0.387	0.058	0.396	0.280	0.362	0.450
GMAUH4	0.322	*0.908*	0.292	0.411	0.382	0.392	0.064	0.380	0.281	0.318	0.439
GMAUH5	0.350	*0.900*	0.312	0.450	0.383	0.395	0.086	0.415	0.319	0.352	0.482
IGMA1	0.549	0.253	*0.847*	0.375	0.369	0.412	0.120	0.410	0.374	0.332	0.310
IGMA2	0.487	0.287	*0.844*	0.410	0.359	0.453	0.108	0.377	0.316	0.376	0.315
IGMA3	0.588	0.264	*0.886*	0.389	0.397	0.427	0.116	0.415	0.370	0.331	0.289
IGMA4	0.580	0.291	*0.917*	0.427	0.408	0.463	0.159	0.422	0.365	0.321	0.318
IGMA5	0.648	0.318	*0.931*	0.418	0.408	0.415	0.157	0.392	0.357	0.312	0.337
IGMA6	0.639	0.333	*0.930*	0.409	0.408	0.412	0.162	0.398	0.365	0.333	0.346
PEE1	0.482	0.425	0.430	*0.838*	0.412	0.430	0.128	0.433	0.368	0.436	0.392
PEE2	0.384	0.437	0.369	*0.846*	0.363	0.439	0.054	0.356	0.291	0.332	0.412
PEE3	0.438	0.443	0.390	*0.882*	0.394	0.470	0.028	0.387	0.338	0.372	0.368
PEE4	0.414	0.423	0.435	*0.893*	0.375	0.462	0.061	0.390	0.310	0.344	0.402
PEE5	0.444	0.400	0.392	*0.933*	0.392	0.475	0.059	0.399	0.317	0.372	0.401
PEE6	0.432	0.400	0.384	*0.919*	0.389	0.470	0.040	0.398	0.317	0.382	0.390
PEOU1	0.342	0.278	0.336	0.266	*0.780*	0.335	0.054	0.367	0.262	0.184	0.280
PEOU2	0.463	0.393	0.440	0.416	*0.892*	0.413	0.079	0.437	0.353	0.311	0.347
PEOU3	0.433	0.380	0.373	0.374	*0.842*	0.379	0.043	0.404	0.301	0.304	0.312
PEOU4	0.458	0.372	0.375	0.404	*0.882*	0.400	0.067	0.443	0.324	0.292	0.347
PEOU5	0.473	0.391	0.368	0.387	*0.873*	0.456	0.056	0.415	0.323	0.301	0.330
PEOU6	0.299	0.299	0.289	0.337	*0.733*	0.281	0.067	0.341	0.286	0.179	0.307
PQ1	0.507	0.407	0.431	0.471	0.430	*0.895*	0.046	0.432	0.406	0.403	0.410
PQ2	0.428	0.376	0.382	0.431	0.393	*0.874*	0.052	0.417	0.340	0.355	0.368
PQ3	0.499	0.358	0.452	0.458	0.382	*0.900*	0.074	0.391	0.372	0.381	0.385
PQ4	0.472	0.386	0.438	0.431	0.408	*0.893*	0.094	0.423	0.330	0.370	0.384
PQ5	0.464	0.436	0.409	0.479	0.393	*0.827*	0.106	0.427	0.350	0.372	0.418
PS1	0.036	0.036	0.018	0.012	0.001	0.039	*0.703*	-0.015	0.049	-0.018	0.018
PS2	0.168	0.055	0.153	0.071	0.073	0.042	*0.880*	0.080	0.096	0.049	0.096
PS3	0.155	0.062	0.095	0.049	0.079	0.064	*0.865*	0.046	0.084	0.053	0.046
PS4	0.130	0.078	0.175	0.061	0.039	0.095	*0.877*	0.102	0.117	0.050	0.125
PS5	0.186	0.062	0.125	0.072	0.073	0.099	*0.872*	0.057	0.107	0.061	0.067
PSR1	0.433	0.383	0.410	0.414	0.436	0.445	0.076	*0.883*	0.435	0.381	0.423
PSR2	0.425	0.368	0.383	0.376	0.396	0.387	0.079	*0.880*	0.424	0.290	0.417
PSR3	0.499	0.428	0.416	0.396	0.435	0.437	0.084	*0.916*	0.432	0.327	0.445
PSR4	0.485	0.425	0.435	0.426	0.475	0.475	0.059	*0.914*	0.432	0.365	0.460
PSR5	0.460	0.375	0.402	0.370	0.409	0.382	0.091	*0.892*	0.470	0.311	0.405
PSR6	0.324	0.317	0.304	0.368	0.381	0.366	0.014	*0.764*	0.375	0.239	0.389
PT1	0.366	0.284	0.323	0.297	0.342	0.334	0.119	0.463	*0.853*	0.225	0.382
PT2	0.342	0.282	0.307	0.299	0.329	0.346	0.114	0.441	*0.854*	0.211	0.374
PT3	0.364	0.236	0.321	0.296	0.304	0.342	0.066	0.382	*0.852*	0.216	0.301
PT4	0.397	0.283	0.374	0.348	0.310	0.363	0.117	0.393	*0.864*	0.258	0.345
PT5	0.376	0.322	0.365	0.308	0.287	0.350	0.071	0.397	*0.812*	0.295	0.333
PU1	0.380	0.322	0.310	0.340	0.275	0.350	0.051	0.321	0.238	*0.871*	0.322
PU2	0.387	0.371	0.329	0.335	0.281	0.376	0.066	0.339	0.247	*0.869*	0.334

PU3	0.373	0.282	0.299	0.377	0.264	0.341	0.024	0.284	0.234	***0.830***	0.328
PU4	0.388	0.337	0.371	0.357	0.296	0.383	0.040	0.340	0.262	***0.896***	0.353
PU5	0.329	0.315	0.275	0.404	0.244	0.378	0.068	0.271	0.239	***0.788***	0.378
UGMA1	0.372	0.450	0.326	0.420	0.375	0.408	0.057	0.442	0.377	0.378	***0.888***
UGMA2	0.378	0.468	0.315	0.415	0.345	0.401	0.091	0.430	0.366	0.357	***0.926***
UGMA3	0.297	0.437	0.285	0.380	0.316	0.399	0.051	0.408	0.332	0.356	***0.840***
UGMA4	0.333	0.489	0.310	0.379	0.350	0.424	0.080	0.422	0.348	0.367	***0.893***
UGMA5	0.397	0.473	0.355	0.415	0.355	0.403	0.109	0.460	0.402	0.366	***0.942***
UGMA6	0.385	0.450	0.345	0.404	0.341	0.395	0.121	0.456	0.392	0.355	***0.932***

4.4. Structural model assessment

Once evaluated the measurement model, this study proceeded to examine the structural model, which is also known as inner or path model, by using the PLS-SEM. Analyzing the structural model involved an in-depth examination of the path coefficients, which reveal the strength and significance of the relationships between the constructs i.e., exogenous (independent) and endogenous (dependent) variables. This analysis helps to understand the direct impacts that the exogenous variables have on the endogenous ones, which is crucial for grasping the practical implications and validating the hypothesized relationships within the framework of the study. Furthermore, the model's predictive power was assessed using the R^2 value, which measures how well the endogenous variables are explained by the model. The Q^2 value was also examined to evaluate the model's ability to predict unseen data points. Additionally, the effect sizes of the exogenous variables on the endogenous ones were also determined by using the f^2 statistic, providing a quantifiable measure of their relative impact within the model. These comprehensive analytical techniques are essential for evaluating the effectiveness of the structural model, including its significance, applicability, predictive accuracy, and relevance, as well as the influence exerted by the exogenous variables. The study employed bias-corrected bootstrapping with 95% confidence intervals to test the study hypotheses, offering a robust examination of the complex relationships and effects among the predicting and outcome variables, thus allowing for the drawing of substantial conclusions. This employed Type-I Reflective structural model evaluate the paths (Shmueli et al., 2019).

4.5. Hypotheses results

Hypothesis testing was carried out with the help of bootstrapping method by taking 5000 subsamples, conclusions were made based on path coefficients, p and t-values. Regarding H1, as shown in Table 7 and Figure 3, PT had positive and significant impact on AGMAs (B = .113, t = 2.696, p = .007), with small effect size (F^2 = .017), so H1 was supported. Regarding H2, as shown in Table 7 and Figure 3, PS had positive and significant impact on AGMA (B = .106, t = 3.259, p = .001), with small effect size (F^2 = .021), so H2 was also supported. Regarding H3, as shown in Table 7 and Figure 3, PQ has a positive and significant impact on AGMA (B = .204, t = 4.048, p < .001), with small effect size (F^2 = .046), so H3 was also supported. Regarding H4, as shown in Table 7 and Figure 3, PSR had a positive and significant impact on AGMA (B = .144, t = 3.016, p = .003), with small effect size (F^2 = .023), thus H4 was supported. Regarding H5, as shown in Table 7 and Figure 3, PU had a positive and significant impact on AGMA (B = .144, t = 3.339, p = .001), with small effect size (F^2 = .029), thus H5 was supported. Regarding H6, as shown in Table 7 and Figure 3, PEOU had a positive and significant impact on AGMAs (B = .184, t = 3.879, p < .001), with small effect size (F^2 = .042), thus H6 was supported. Regarding H7, as shown in Table 7 and Figure 3, PEE had a positive and significant impact on AGMAs (B = .129, t = 2.535, p = .012), with small effect size (F^2 = .020), thus H7 was also supported. Regarding H8, as shown in Table 7 and Figure 3, AGMA had a positive and significant impact on UGMA (B = .290, t = 4.738, p < .001), with small effect size (F^2 = .059), thus H8 was also supported. Regarding H9, as shown in Table 7 and Figure 3, UGMA had a positive and significant impact on GMAUH (B = .510, t = 11.560, p < .001), with large effect size (F^2 = .352), thus H9 was also supported.

Table 7. Summary of the Hypothesis Testing

| No.	Statement	Status
H1	There is a positive effect of users' perceived trustworthiness on attitudes towards GMA use.	Supported
H2	There is a positive effect of users' perceived security on attitudes towards GMA use.	Supported
H3	There is a positive effect of users' perceived quality on attitudes towards GMA use.	Supported
H4	There is a positive effect of users' perceived skills readiness on attitudes towards GMA use.	Supported
H5	There is a positive effect of users' perceived usefulness on attitudes towards GMA use.	Supported
H6	There is a positive effect of users' perceived ease-of-use on attitudes towards GMA use.	Supported
H7	There is a positive effect of users' perceived effort expectancy on attitudes towards GMA use.	Supported
H8	There is a positive effect of users' attitude towards GMA use on their GMA actual use.	Supported
H9	There is a positive effect of GMA actual use on users' happiness.	Supported
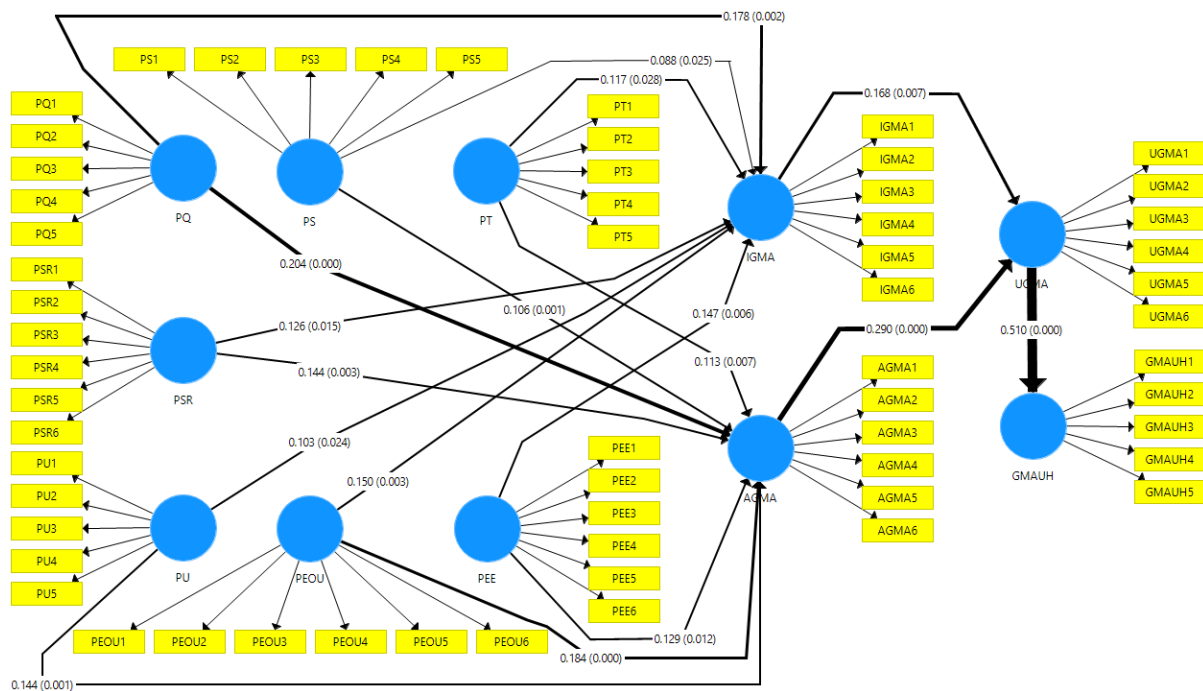
Figure 3. Structural Model

4.6. Quality assessment of the structural model

4.6.1. Coefficient of Determination or R square

To assess how well the structural model predicts actual outcomes, the R^2 value was examined. This statistic represents the squared correlation between the predicted and actual values of the dependent variables, providing an estimate of how much variance in these variables has been explained by the independent variables. The R^2 values in the model indicate how much the independent variables collectively contribute to the variance in the dependent variables. Higher R^2 values suggest that the independent variables have a stronger impact on the dependent variables (Hair et al., 2019). In the current statistical model, the dependent variables include AGMA, UGMA and GMAUH, while independent variables included PT, PS, PQ, PSR, PU, PEOU, PEE, AGMA and UGMA. According to Table 8, PT, PS, PQ, PSR, PU, PEOU and PEE explained and 47% variance in AGMA. Similarly, AGMA explained a variance of 17.6% in UGMA, whereas UGMA explained 26% of the variance in GMAUH.

4.6.2. Predictive Relevance or Q square

In the current research, we employed a technique called blindfolding technique, where every 7th data point was temporarily left out of the analysis. This method helped us compute cross-validated redundancy or Q^2 values for all dependent variables. The Q^2 value acts as an indicator of how well the structural model can predict outcomes based on the independent variables. A positive Q^2 value suggests that the model is effective in making accurate predictions about the outcomes variables. Indeed, in this study, all outcome variables showed positive Q^2 values, as detailed in Table 8.

4.6.3. Collinearity Issues

In order to ensure the reliability of the structural model, we checked Variance Inflation Factor (VIF) values to find out the signs of problematic collinearity. Elevated VIF values can indicate issues with collinearity, which can affect the accuracy of the model. Fortunately, the obtained VIF values fell under an acceptable value of 3.3, as displayed in Tables 8. This confirmed that the model was not impacted by path contamination or collinearity, indicating its high quality. The model's resilience against potential issues like path contamination and collinearity enhances its credibility. The absence of these issues significantly contributes to the quality and reliability of the current structural model. Researchers can have confidence in the accuracy of the model's forecasts and explanations, as it is robust and free from potential sources of bias leading to enhanced validity and trustworthiness of the overall statistical model.

Table 8. Quality Measurement of the HOC-HOC Structural Model

Outcome Variable	R Square	Q Square	VIF
AGMA	0.470	0.364	1.692
UGMA	0.176	0.143	1.740

GMAUH	0.260	0.207	1.000

5. DISCUSSION

In light of the user behaviors and analysis along with empirical evidence it has become clear that the perceived trustworthiness at higher level leads to favorable attitude towards the GMA adoption supporting H1. This means that the higher the level of trust with regard to the security and protection of data, openness as well as reliability of government mobile application, the higher the level of adoption and usage already discussed in the literature. Moreover, this hypothesis is supported by literature noting that trustworthiness improves the user perceived attitude towards technology (Habib et al., 2018). The results of this study show that GMAs perceived by the user as credible, evoke more positive attitude towards their use, supporting other studies linking trust with positive technological beliefs and practices. Findings on the H2 regarding the influence of the perceived security of users on their attitude toward GMAs offer valuable evidence. The research focuses on the reception of people to government apps and how their beliefs about the safety of their personal data in these applications affect their behavior and levels of engagement. Overall, there is a high level of supporting evidence for the identified positive association between perceived security and attitudes towards the use of GMA. Those users from this study who reported being secure when using government apps exhibited more positive attitudes to the apps which is consistent with findings linking security to user perceptions and technology acceptance (Denaputri & Usman, 2019; Vasudevan, 2024).

The analysis focuses on how people's perceptions of the usability, functionality, and quality of apps from government affect their attitudes and adoption in support with H3. Analyzing the collected data, it is possible to establish that the positive correlation between perceived quality and the attitudes toward GMAs usage is confirmed by the results of empirical research, including users' reflections on their experiences. This implies that as user consider government mobile applications to be more easy to use, credible and efficient in delivering services, they are more likely to be satisfied and have trust in the application. Supporting this hypothesis, studies conducted in the literature highlight that perceived service quality relates directly to user attitudes. This analysis also showed that the participants who had a positive perception about GMAs in terms of delivering quality services provided positive perceptions towards its use as supported by other past research that relates to high service quality enhancing users' perceptions and usage (Alzoubi et al., 2020; Hamadneh, 2024).

As indicated by the findings of this study based on users' knowledge and self-ascribed proficiency level, a significant and positive relationship between the degree of skills readiness and GMA attitudes exists supporting the H4. This implies that the more users find themselves competent and ready to engage in the use of government mobile applications, the more chances they have of engaging with and adopting the platform. The study findings in relation to the perceived usefulness of GMAs, as well as the empirical data gathered, clearly reveal that more positive attitudes towards the use of GMA are associated with higher levels of perceived usefulness supporting the H5 (Ventre & Kolbe, 2020). This implies that the more the users regard the government mobile applications as being useful in delivering information, responding to tasks in a more convenient way and improving the user experience of public services, the more the likelihood of the customers embracing and relying on the government mobile applications. This hypothesis supports previous findings that reveal perceived usefulness as a strong factor responsible for positive attitudes toward technology. Consequently, the results of this study provide evidence to support previous research that links perceived usefulness of GMAs to the development of favourable attitudes among the users (Ohk et al., 2015).

In order to investigate H6, the study findings implies that the more users like the concept and intuitive nature of government mobile applications that are easy to comprehend and engage with, the more satisfied and likely they are to use these platforms. Hence, the results of this study support the notion of the need for organizations to adopt designs that are people-oriented and provide easy-to-use interfaces (Rawashdeh et al., 2021) in order to improve user perceptions of the level of ease-of-use of the technology, and therefore increase the usage of GMAs for accessing efficient government services. The research looks at the extent to which the perceived ease and trial associated with the usage of GMAs affects the attitude and the use/generation of GMAs supporting H7. Therefore, based on the synthesis of users' quantitative accounts of their journeys through GMA, it can be posited that perceived effort expectancy is an important predictor of favorable attitudes towards GMA use (Kapoor & Singh, 2020). This hypothesis is supported by previous literature revealing that lower effort expectancy results in improved attitude towards the technology in question. In line with prior studies, stressing the contribution of effort reduction to positive changes in using GMAs, participants of this study described that their favourable perceptions corresponded to the effort required in the use of particular apps.

From the analysis of the data presented, it can be seen that, as the attitude to use GMAs rises, the actual usage increases as well supports the H8. This means that while communicating their intention to use government mobile applications because of perceived benefits such as convenience, accessibility, and efficiency, in accessing public services these users are likely to actually engage in the use of this platforms as envisaged (Mohtar et al., 2022). It is therefore important to note that by considering the application of comprehensive user attitude analysis and empirical research, it would be evident that positive attitudes towards GMA has a positive relationship with actual usage supporting the H8. The impact of attitudes on user is well supported by prior research that states the attitudes of the users about a technology will make them adopt it (Belanche et al., 2020). In this study, perceived attitudes of the participants regarding GMAs revealed higher actual usage by the participants thereby supporting previous research findings that reflect an association between perceived usage and actual usage of the technology. This suggests that the extent to which the users hold a positive attitude towards government mobile

applications where the applications are seen as being helpful, credible, and useful for accessing services, will increase the likelihood that the users engage with these platforms (Kondrateva et al., 2020). The research evidence shows that the availability and convenience afforded by GMAs do improve the customers' satisfaction levels with the governmental services thus increasing their levels of happiness supporting the H9 indicating parallel findings with literature (Alzoubi et al., 2020). The opportunity to find the necessary information, make purchases or conclude contracts without any problems, as well as receive urgent information through these applications eliminates the main complaints about formal procedures. This hypothesis is supported by literature evidence which asserts that technology usage is a leading variable that results in increased user satisfaction and happiness (Iacurci, 2021). Consequently, the result of this study shows that participants with active GMAs report enhanced happiness indicating a positive correlation between digital government services and perceived quality of life among users.

6. CONCLUSION

This study in detail has unveiled the complex relationship that exists between on the attitude to use of UAE Government Mobile Apps (GMA) on one hand and on the other hand investigating the influence GMA use on GMA users' happiness. Through the extension of the Technology Acceptance Model (TAM) direction, it has been shown that there are some determinants that really contribute to peoples' perception and decisions on GMAs implementation. The key functionalities of the perceived usefulness, ease of use, and perceived skill readiness have been demonstrated through this study to greatly play critical role in users' attitude to use GMAs.

6.1 Theoretical implications and practical implications

This study contributes to the existing knowledge by focusing on happiness as one of the most important results of technology acceptance that also indicates the inner interaction between acceptance and user attitudes. The outcomes prove the worth of satisfaction received in activating the happiness level of users with a presumption that leads to the theory of the emotional drivers of GMAs usage. Further, the recognition of the determinants and concepts such as perceived usefulness and perceived ease of use support. Recognizing the factors that would drive attitude and usage of UAE Government Mobile Apps (GMA) through the lens of users' happiness can be beneficial in many ways to business communities especially in the development of more effective applications and in the delivery of service. In the context of examining user engagement with government mobile applications, the current research draws on the factors identified in the extended TAM. For instance, perceived ease of use, perceived usefulness or the overall of other perceptions in the model of a user is important. The overwhelming attitude can be complimented when the companies intend to design usable interfaces that satisfy the practical use of the apps. Besides intervening to smooth the conveyance of information to the targeted users, this approach also fosters greater utilization, which is important for organizational effectiveness. Incorporating the result of this study can also improve the partnership between business organizations and government organizations. Depending on the government need for an increased use of technology in providing improved public services, businesses that are familiar with the antecedents of user attitude towards specific applications can market themselves as viable players for the development and implementation of such applications. If the features developed for the app match the government's goals like transparency, easy access and user-focused services, then organizations can contribute to a better user community. This partnership does not only enhance the business legitimacy but also respond to the overall effort to enhance the delivery of public services in order to benefit all the parties involved.

6.1 Limitations and recommendations

Regardless of the findings from this study, some limitations still need to be mentioned. Firstly, the use of statistical data implies the possibility of response bias, as the participants may either give socially desirable answers or inaccurately report their attitudes and behaviors. Secondly, the generalizability of the results could be confined by the environment of the UAE and the characteristics of the sample group. Thirdly, cultural, socioeconomic, and technological differences within regions might affect users' perceptions and behaviors differently. Moreover, cross sectional study design does not permit to draw causality inferences and monitoring changes in users' attitudes and behavior over time. On the other hand, even though the extension of the Technology Acceptance Model (TAM) explains GMAs adoption in a comprehensive way, there are more significant factors such as psychological well-being, economic stability, cultural and societal norms that could influence the level of happiness. As future studies would be a good way to address these limitations, they could be using more diverse and representative samples, mixed-method approaches, and exploring additional variables which would provide richer understandings about GMAs use and its influence on user happiness.

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