Factors affecting Customers' intention to use e-government in Egypt

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Abstract:

E-government was developed to assist with digital transformation projects and is seen as a successful way to change public sector governance in Egypt. The purpose of this article is to investigate how Egyptian people' intentions to use e-government are influenced by perceived risk, social influence, and awareness. A web-based survey was used to collect data from 450 consumers of e-government services. Data analysis tools used were PLS-SEM and SPSS. The results demonstrated that perceived risk and social influence have a significant impact on the intention to use e-government in Egypt. Regarding citizens' intention to use e-government services, awareness has little effect.

Keyword: Egypt, Perceived Risk, awareness, E-government

الملخص:

نشأت الحكومة الإلكترونية للمساعدة في مشاريع التحول الرقمي، وهي إحدى الطرق الناجحة لتغيير إدارة القطاع العام في مصر. الهدف الأساسي من هذا البحث هو التحقق من كيفية تأثر رغبة المواطنين المصريين من مستخدمي الخدمات الحكومية لاستخدام الحكومة الإلكترونية بالمخاطر المتوقعة والتأثير المجتمعي والوعي. واستُخدمت لهذا الهدف دراسة استقصائية على شبكة الإنترنت لجمع البيانات من ٤٥٠ مستخدم لخدمات الحكومة الإلكترونية. وكانت أدوات تحليل البيانات المستخدمة هي النظام المتكامل للرصد والتقييم والنظام وأظهرت النتائج أن المخاطر المتوقعة والتأثير المجتمعي لهما تأثير واضح على نية المواطن لاستخدام الخدمات الحكومية الإلكترونية في مصر. وفيما يتعلق باعتزام المواطنين استخدام خدمات الحكومة الإلكترونية، فإن الوعي لم يظهر له أثر يذكر.

كلمات مفتاحية: مصر – المخاطر المتوقعة – الوعي – الحكومة الإلكترونية

1. Introduction

Information systems and mobile technologies are rapidly developed, therefore, many companies in different fields are replacing personnel with self-service technologies (e-services) for the purpose of cost reduction. It is an innovative technology that allows users to take advantage of services without the involvement of service employees (Feng et al., 2019). Consequently, e-service has become one of the most important subjects for researchers because of its benefits and value they produced for customers and service providers. As mentioned by Hsu et al. (2021) An increase in the number of consumers that a

company serves may be accomplished via the use of e-service without the need for the company to hire additional staff members or construct new physical stores.

The employment of information and communication technology (ICT) has resulted in the transformation of traditional forms of communication between government agencies and individuals, which has been replaced by digital interaction within the public services. The implementation of this technology has enabled governmental organizations to be more effective and to deliver essential services to citizens in a more convenient and time-efficient way (Abdulkareem et al., 2022). E-government was established to support digital transformation initiatives and is considered as an effective means of reshaping governance in the public sector, which leads most governments to use new technologies to create new communication channels in the public sector (Tsui, 2019). Governments are starting to use e-government systems to ensure outstanding and efficient service delivery to their citizens (Hidayat Ur Rehman et al., 2023).

In the last twenty years, governments all over the world have adopted electronic government systems. These systems entail the utilization of ICT in order to enhance communication between citizens and the government. (Reissig et al., 2022). E-government, as per the United Nations' definition, includes all ICT platforms and applications utilized by the public services.

Aligned with Egyptian Vision 2030, the government is working continuously to promote digital services at all ministries and government agencies. The strategic objectives of digital transformation in Egypt mainly rely on enhancing services presented to citizens through digitizing them (IDSC 2021). Based on the United Nations electronic government Knowledgebase[1] (2022), Egypt is placed 103rd out of 193 nations in the electronic government development ranking.

The purpose of this research is to get an understanding of the significance of self-service technology in the realm of public service, as well as its role in boosting the accessibility, simplicity, and speed with which services are provided. The article investigates the impact that citizens' expectations regarding the amount of work they will put in, the level of performance they expect, and their level of trust in the services provided by the government have on their views regarding their interest in using electronic government.

The subsequent text outlines the organization of this paper: First, an extensive review of prior research papers about the advancement of e-government. The following section examines many elements that influence individuals' intention toward usage of e-government. The considerations include the perceived risk,

[1] The United Nations E-Government Development Database (UNeGovDD) is a benchmarking tool that provides a comparative assessment of the e-government development of UN Member States

social influences, and awareness. Next, researcher formulates the conceptual framework as well as study hypotheses. The following section is the outline of the research methodology employed for collecting and analyzing data. Following that, the paper presents the outcomes and subsequent analysis of the findings. The paper concludes by presenting the theoretical and managerial implications, emphasizing the study's limits, and making recommendations for further research.

2. Literature Review

2.1.E-government

The first presence of governments on the internet was through some pages offering information about agencies and some services available to citizens, then some governments offered email and search engines to facilitate interaction with residents, and finally, the interaction and communication between governments and citizens started through national portals (Gil-Garcia & Martinez-Moyano, 2007).

The term of electronic gov. refers to the use of information technology to implement any transaction processes between governmental departments and citizens to reduce the costs of paper handling, transportation expenses, and waiting time (Arendsen et al., 2014). E-gov. is the use and acceptance of technological innovation in governmental operations, with the aim of simplifying processes and enhancing convenience for

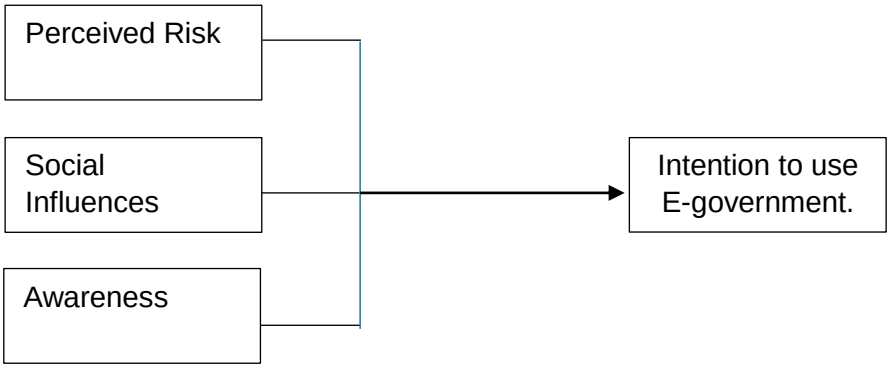
citizens, while also facilitating easy access to government services. (Amosun et al., 2022).

More studies have been conducted in order to investigate the various aspects that influence the e.gov. establishment. (Elsheikh et al., 2022). However, a clear understanding of citizens' intention about the use of electronic services needs to be included in the public services, as the experience gained in the private sector cannot be applied directly to the governmental sector (Gesk & Leyer, 2022).

All Egyptian sectors participated in the launch of the new government services on the Digital Egypt Platform, which was a collaborative effort between the Ministry of Communication and Information Technology MCIT and all Egyptian sectors. The subscribers on the Digital Egypt Platform exceeded 4.2 million. There are approximately 49,929 employees in the governmental sector are trained in information systems and digital transformation units. In addition, residents can access the services of the electronic government through the Digital Egypt platform https://digital.gov.eg/, http://misr.gov.eg/ Call Center #15999, Post Offices, and Mobile Application such as, "Tawasol", Egypt E-visa, and the Ministry of Interior website www.mcit.gov.

2.2. The conceptual framework and hypotheses

An illustration of the study framework can be viewed in Figure 1. There are a lot of different reasons that might influence the decision to adopt electronic government, according to the research. This research argued that the intention to utilize electronic government is impacted by perceived risk, social influence, and awareness.



2.3. The relationship between perceived risk and intention to use e-government.

The concept of perceived risk was initially established by purchasers in 1960. Risk is the possibility of experiencing harm or suffering. Customers' purchasing decisions are influenced by the perceived level of risk associated with a service or product (Beqai, B., 2022). Perceived risk, as described by Bélanger & Carter (2008), refers to an

individual's anticipation of encountering negative consequences or unsatisfactory results.

Risk implies any negative outcomes that arise from participating in certain behaviors (Saxena, 2018). Perceived risk is an individual's belief in the potential for experiencing a loss in a future event, and it is a significant factor that has a negative impact on one's attitude towards the desire to utilize technology (Q. Xie et al., 2017a). Perceived risks refer to individuals' views and perceptions about the possible negative consequences and implications of engaging in a given conduct while using a particular technology or source of information. (Shah et al., 2019).

Many researchers believed that perceived risk have an indirect impact on the intention to utilize e-services by influencing customer attitudes (Lin, 2022). that perceived risk and security level play a crucial role. They suggested that the higher risk associated with electronic environments acts as an obstacle to the adoption of e-services. Saxena (2018) investigated in his research that was held in India the impact of perceived risks on the adoption of mobile government (m-government) services. He utilized a questionnaire to gather responses from 550 citizens. Saxena found that service self-efficacy, customer attitude, and perceived risk significantly influence the adoption and intention to use e-services.

Citizens refrain from utilizing e-government services due to a dearth of trust and the perceived peril associated with their personal and financial data. Individuals might sense many forms of risk when they choose to utilize e-services. Examples include e-services that are not dependable, potential financial hazards, potential delays, and potential negative societal consequences. Hence, the assessment of perceived risk has been regarded as a pivotal element in the implementation, adoption, and intention to utilize e-government. (Yang & Wibowo, 2020).

Bélanger & Carter (2008b), identified four key characteristics that influence users' desire to utilize e-government services: government trust, internet trust, disposition to trust, and perceived risk. Perceived risk encompasses the perception of potential harm related to the disclosure of personal information, privacy concerns, and potential financial loss. This perception of risk has a strong negative impact on the intention to use e-government services, as it reduces the willingness to share information and conduct transactions online. (Li, 2021).

On the other hand, Lin (2022) conducted a study in Taiwan to investigate consumer perceptions and attitudes towards smart retail services. The research included a questionnaire administered to 500 customers. The findings revealed that

perceived risk had a negative impact on consumers' desire to use e-services. Qalati et al. (2021), attempted to examine how service quality and reputation influence the perceived risk, which in turn affects the inclination to utilize a website or service portal.

H1: Perceived risk has a significant impact on the intention to use e-government.

2.4.Social influences and intention to use e-government.

Venkatesh et al. (2012) provided a definition of social influence as the degree to which consumers sense that significant individuals in their lives, such as family and friends, believe they should adopt a specific technology. It means that an individual's mindset is shaped by the people of their community. According to Venkatesh et al. (2012) social influences are comparable to subjective standards in the idea of rational actionIt refers to the extent to which an individual regards technology as significant based on the viewpoints of peers and influential figures in their community (Jalil & Yeik, 2021; Liu & Hung, 2021; Sentosa & Mat, 2012).

Giovanis et al. (2019) examined the impact of social variables on the adoption of mobile self-service retail banking technology. They conducted a survey with 513 participants and found that potential consumers consistently seek alternative

experiences and can be swayed by the opinions of others. Therefore, social forces exert a significant influence on the intention to utilize e-services.

In their study on acceptance and use predictors of open data technologies, Zuiderwijk et al. (2015) utilized the unified theory of acceptance and use of technology (UTAUT) and administered a questionnaire. They found a positive correlation between social influence and the intention to use and accept technologies.

In the realm of e-government, Li (2021) conducted a study on the relationship between trust, risk, and citizens' adoption of e-government services using the UTAUT model. The research findings indicate that social influence has a favorable impact on citizens' adoption of e-government. Chatzoglou et al. (2015) argued in their study that aimed to explore the factors affecting the intention to use e-government that peer influence plays a role in shaping an individual's behavior by motivating them to adjust their attitudes in order to align with the group.

H2: Social influence has a direct impact on the intention to use e-government.

2.5. The awareness and intention to use e-government.

Service awareness refers to the state of being conscious, possessing knowledge, or being informed about a specific

service (Crist et al., 2007). Furthermore, (Flavián et al., 2022) stated that service awareness involves providing clients with information about the specific service. Although awareness has not been specifically examined in technology acceptance research, it is widely recognized as a significant determinant of technology adoption (Flavián et al., 2022).

E-government awareness is the extent of an individual's knowledge and comprehension of e-government services (Meftah et al., 2015). Several studies asserted that awareness is considered a vital factor that motivates individuals to use e-government services (Almaiah et al., 2020).

Numerous studies have extensively examined the aspects that impact individuals' knowledge of e-government services, and these studies have proposed multiple strategies to enhance citizens' awareness of such services. Therefore, a research were conducted to to investigate the determinants influencing citizens' inclination to embrace e-government services. The findings revealed that individuals' cognizance of e-government services exerts a substantial influence on their intention to utilize such services (Meftah et al., 2015). Moreover, BasitDarem & Ahmed (2008) asserted that the purpose was to investigate the level of awareness among internet users of local government in India regarding government online services. They concluded that in order to promote the adoption and

utilization of e-services, the government needs to enhance citizens' awareness. Moreover, Sipior et al. (2013) asserted in their research on variables influencing e-government website visiting that knowledge had a favorable impact on individuals' intention to engage with e-government.

Shareef et al. (2011) conducted a study to investigate the factors that facilitate citizens' adoption of e-government services. They utilized the technology acceptance model (TAM), diffusion of innovation theory (DOI), and theory of planned behavior (TPB) to analyze citizens' adoption behavior. The study concluded that citizens need to be knowledgeable about the features of e-government, its practical applications, and the strategic advantages it offers in order to adopt it.

H3: Awareness has a significant impact on the intention to use e-government.

Table 1: Items of Questionnaire

Variable	Items	Questionnaire Items
Perceived Risk	PR1	There is a chance that the ordering and payment procedures will not operate due to a system fault.
	PR2	I have concerns regarding the potential for inaccurate processing or payment when utilizing the e-government service.
	PR3	Revealing personal information on e-government platforms carries inherent risks.
	PR4	Sharing financial information on government websites carries potential risk.

	PR5	Overall, I hold the view that utilizing e-government websites to obtain government services has inherent risks.
Social Influence	SI1	I am advised by my family and friends to utilize e-government services.
	SI2	I would utilize internet services regardless of the absence of any acquaintances utilizing them.
	SI3	The government promotes the utilization of e-government services.
Awareness	A1	I have a strong understanding of e-government services.
	A2	I possess a certain level of expertise in e-government services.
	A3	I am aware that Egypt has implemented e-government services.
Intention to use e-government	I1	In the future, I plan to persist in utilizing e-government portals to access government services.
	I2	I am ready to consistently use e-government services.
	I3	Given the opportunity, I will utilize e-government sites.

3. Methods

Given the quantitative approach of this paper, a web-based survey is utilized to collect primary data from the target demographic. The web-based survey is designed on SurveyMonkey and distributed randomly among the target population in Cairo and Alexandria. A link of the questionnaire was sent to different groups and personal contacts via Facebook, Email, and WhatsApp. The questionnaire contains 14 questions and 4 variables and is translated into Arabic. The questionnaire

has been divided into three sections. The first one contains the introductory questions designed to determine if the respondents use any online government services and which services they have used. The purpose of the second part is to collect demographic information, encompassing gender, educational level, age, and previous experience with internet usage and services provided by electronic government. The last part is intended to assess the factors. Participants are asked a set of questions for each variable and are instructed to indicate their degree of agreement with the statement using a five-point Likert scale, which ranges from "strongly disagree" to "strongly agree". The questionnaire items have been constructed based on prior research and modified to suit the specific setting of this work. (Almaiah et al., 2020; Jeon et al., 2020; Mansoori et al., 2018; Venkatesh et al., 2003; Zhang et al., 2012). The sample size should be representative of the population and contain an adequate number of people. Increasing the number of participants improves the validity and reliability of the results (Almaiah et al., 2020; Hair et al., 2019).

The appropriate sample size for various population at a 95 percent confidence level according to (Saunders et al., 2012) is 384 participants. However, 600 questionnaires were distributed, 450 were returned valid for further analysis. As a result of the large population that targeted any citizen living in Egypt, the sampling frame is not available. Hence, this paper adopted the

non-probability convenience sampling technique (Malhotra et al., 2017)

Table 2. Demographic characteristics of respondents (n = 450)

Variables	Categories	Frequency	Percent
	18-25	75	16.60%
	26-29	47	10.40%
	30-39	166	36.80%
	40-55	132	29.40%
	56-65	8	4.90%
	more than 65	3	1.80%
	Total	450	100.0%
Gender	Male	298	66.3%
	Female	152	33.7%
	Total	450	100.0%
Place of Living	Cairo	359	79.8%
	Giza	41	9.2%
	Alexandria	25	5.5%
	Other	25	5.5%
	Total	450	100.0%
Level of Education	Middle or High School (In Progress)	6	1.2%
	Intermediate qualification (high school or diploma)	3	0.6%
	Above average qualification (high school and two years later)	0	0.0%
	undergraduate (in college)	41	9.2%
	University qualification	221	49.1%
	Master's degree	124	27.6%
	Doctorate	55	12.3%

Variables	Categories	Frequency	Percent
	Total	450	100.0%
Monthly Income	Less than 5,000	44	9.8%
	5,000 EGP – 10,000 EGP	108	23.9%
	10,001 EGP –20,000 EGP	116	25.8%
	20,001 EGP – 30,000 EGP	88	19.6%
	30,001 EGP – 40,000 EGP	33	7.4%
	40, 000 EGP or above	61	13.5%
	Total	450	100.0%

Table 2 presents the demographics of the respondents to the survey. The highest proportion of the whole sample is living in Cairo (79.8%). The sample demonstrates that majority of the respondents were males, with a percentage of 66.3%. Regarding the educational level of the respondents, the sample shows that 221 (49.1%) of the respondents are graduates. The most common income falls within the range of 10.000 to 20.000 EGP (25.8%).

4. Data Analysis and Results

4.1. Measurement model

Firstly, reliability is evaluated by applying Cronbach's alpha coefficient and composite reliability. Table 3 demonstrates that the Cronbach's alpha values for all variables exceed 0.7, implying that the factors represent over 50% of the indicator's variability. Furthermore, all coefficients employed to evaluate the reliability of the model variables are statistically valid, indicating that all

variables exhibit a notable degree of internal consistency. (Hair et al., 2019). The study's Cronbach's alpha scores varied from 0.752 to 0.861, indicating that the response levels for each dimension are consistent. Aside from Cronbach's alpha, the composite reliability ranged from 0.785 to 0.888, indicating acceptable reliability of the components.

For the purpose of evaluating the model for the study, Smart PLS 4.0 is used. The results of Table 3 indicate that the variables have outer loadings values greater than (0.70), which indicates that all variables and their statements have high levels of convergent validity. That is, the statements for each variable measure the variable to a high degree, which indicates that the variable data is appropriate for subsequent statistical analyses.

Discriminant validity is assessed to confirm that the latent constructs employed to evaluate cause-and-effect relationships in the study are distinct and do not measure the same phenomena. This is important to avoid the problem of multicollinearity (Fornell & Larcker, 1981). The assessment of discriminant validity was conducted using the Fornel-Lacker criteria. As illustrated in Table 4, this criterion indicates that the square root of the average variance extracted (AVE) for each variable is greater than the correlations between the variable and the remaining variables.

Table 3. The results (CR value, Cronbach's alpha, and AVE) from the measurement

Constructs	Item	Outer Loadings	Cronbach's alpha (α)	Composite reliability (CR)	AVE
Perceived Risk	PR1	0.714	0.762	0.790	0.729
	PR2	0.823			
	PR3	0.801			
	PR4	0.800			
	PR5	0.777			
Social Influence	SI1	0.807	0.752	0.785	0.660
	SI2	0.812			
	SI3	0.750			
Awareness		0.712	0.811	0.844	0.680
		0.790			
		0.814			
Intention to use e-government	I1	0.780	0.861	0.888	0.668
	I2	0.825			
	I3	0.810			

Table 4. Correlation matrix of key construct

Variables	Social influence	Perceived Risk	Awareness	Intention to use e-government
Social influence	**0.812**			
Perceived Risk	0.833	**0.854**		
Awareness	0.803	0.820	**0.825**	
Intention to use e-government	0.793	0.778	0.808	**0.817**

4.2.Structural model assessment

Following the analyzing of measurement models, PLS-SEM involves the evaluating the structural model. For more accuracy, it is crucial to examine the degree of collinearity in the structural model. This paper uses VIF to identify multicollinearity. A variable is considered highly collinear if the correlation between independent variables is higher than 0.90 (Gujarati & Porter, 2009). Table 5 demonstrates the absence of multicollinearity problems since all Variance Inflation Factor (VIF) values are below 5.

Table 5. Collinearity statistics (VIF):

Variables	VIF
Social influence	2.222
Perceived Risk	1.001
Awareness	4.121
Intention to use e-government	3.252

This research utilizes the bootstrapping approach to evaluate the relationships among the variables by employing the values of the path coefficients. The Coefficient of determination, often known as R2, quantifies the accuracy of linear models and represents the proportion of the corrected sum of squares explained by the model. (Piepho, 2019). The coefficient of determination, R2, is mostly used to evaluate the precision of the regression model's alignment with the data (Moksony, 2000).

The path coefficient (B = 0.377) between perceived risk and the desire to utilize e-government is statistically significant at the 0.05 level, indicating that H1 is accepted.

The path coefficient (B = 0.420) between social influence and the desire to utilize e-government is statistically significant at a significance level of 0.05. This suggests that H2 is accepted.

The path coefficient (B = 0.052-) between awareness and the intention to use e-government is not statistically significant at the 0.05 level. This suggests that awareness does not have an impact on the desire to use e-government. Therefore, we reject hypothesis H3.

5. Discussion

5.1. Perceived risk has a significant impact on the intention to use e-government.

The results of this study showed that users' intentions to use e-government services are significantly impacted by perceived risk (H1). This finding is in line with the assertion made by Rallis et al. (2019) that users' intentions to use e-government services may be negatively impacted by perceived risk due to the possibility of unexpected failure during transactions. (Li, 2021) investigated how perceived risk affected people's intentions to use e-government. Similar to the current paper, his study found that individuals' intentions to use e-

government are significantly impacted negatively by perceived risk, which may also make them less eager to provide personal information to e-government portals. According to (Habib & Hamadneh, 2021), a key element in understanding customer intention is perceived risk.

5.2. Social influence has a direct impact on the intention to use e-government.

This paper and earlier research both support the impact of social influence on the intention to adopt e-government (H2). In their study to investigate the factors influencing the intention to adopt e-government services in Malawi Ziba & Kang (2020) confirmed that social influences have a positive effect on the intention to use e-government. They also found that most people are motivated to use e-government because they refuse to socially lag behind in using technology. The adoption of e-government is significantly influenced by social impacts on behavior. People are more likely to use e-government if they believe that its adoption is the norm in society. (Muhammad & Kaya, 2023).

5.3. Awareness has a significant impact on the intention to use e-government.

In line with earlier research, the current paper does not support the impact of awareness on the desire to use e-government

(H3). However, The number of respondents to the questionnaire, which revealed that 84.05 percent of respondents now use e-government, helps to explain this conclusion, though, since it suggests that awareness is not a major factor influencing respondents' intentions to use e-government. Hidayat Ur Rehman et al., (2023) tested the association between awareness and e-government use. They found that higher levels of awareness are associated with higher levels of belief in the benefits of e-government and intention to use its services.

6. Implications for theory and practice

There are several research that have been conducted concerning online services in different fields, such as healthcare, tourism, mobile banking, hotels, retail, and public sectors. Electronic government is one of the topics that the researchers focused on in European, Asian, and Gulf countries. In Egypt, the number of research that has been exploring the topic of e-government is limited. The paper proposes three factors that directly affect the intention to use e-government. In addition to the academic implications, the results of the current paper also bring several indicators for policymakers. As shown in the model, social influences and perceived risk play a significant role in determining the intention to use the e-government services. In order to provide services perceived as

useful by citizens, authorities should try to develop services that meet the citizens' needs, such as making the system more secure in order to decrease the perceived risk. For that purpose, government officials should take time to explore citizen needs before engaging in system development activities. The findings showed that awareness is an insignificant factor, which indicates that, although Egyptian citizens are aware with e-government services, they are not encouraged to use it. This finding gives more importance to the other factors that may affect the intention to use e-government services.

7. Limitations and recommendations for further research

This paper faced several limitations to be considered as a guide for future research in the same area. This paper specifically focuses on analyzing the effects of effort expectation, performance expectancy, and trust on electronic government services. Nevertheless, further investigation is necessary to analyze the impact of additional elements that might potentially influence the intention to utilize electronic governance. Additionally, two factors from the Unified Theory of Acceptance and Use of Technology (UTAUT) are included in this study. Attitude serves as a mediating variable, as proposed in the Theory of Planned Behavior (TPB). Subsequent studies shall investigate additional components

derived from alternative technological acceptance models. Furthermore, this paper investigates the disposition of people towards the intention to utilize electronic government. Subsequent research should be conducted to explain the attitude of workers and identify their training requirements for delivering electronic services to the residents. Furthermore, the researcher encountered challenges during the analysis of the gathered data as a result of incomplete questionnaires or irrelevant responses. The current article has a very small sample size, which is attributed to time constraints. Future studies should be undertaken in other cities in Egypt.

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