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# Faculty of Business Economics

## Master of Management

***Master's thesis***

***The willingness of citizens to receive municipality / city information digitally***

**Olha Vernyhora**

Thesis presented in fulfillment of the requirements for the degree of Master of Management, specialization International Marketing Strategy

**SUPERVISOR :**

Prof. dr. Lieve DOUCE

**2020**
**2021**

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*This master thesis was written during the COVID-19 crisis in 2020-2021. This global health crisis might have had an impact on the (writing) process, the research activities and the research results that are at the basis of this thesis. There was an impact on the data collection and data analysis. The pandemic hindered the researcher from distributing the questionnaire offline and reaching out to non-users of e-government services. Due to the unrepresentative sample of non-users, it was impossible to test some hypotheses proposed in the thesis.*

**Abstract**

This thesis aims to analyse the factors that influence the willingness of the citizens to receive municipality information digitally. In order to do it, a dual model was applied, consisting of inhibitors on one side, namely the factors that discourage individuals from using e-government technologies, and facilitators, on the other hand, motivators of adoption and continuous adoption utilization. Five facilitators were included: four constructs of the UTAUT theory (performance expectancy, effort expectancy, social influence and facilitating conditions) and perceived fear. As for the inhibitors, four were proposed: resistance, habit, inertia and perceived risk.

The analyses have shown that Performance expectancy is a significant predictor of the citizens' willingness to continue using e-government. Moreover, resistance was found to contributes significantly to users' unwillingness to continue using e-government services. Another finding is that there is no significant difference in e-government usage between men and women.

**Summary**

E-government and its benefits

In most modern countries, government institutions provide a wide range of communication instruments for information exchange with the citizens, businesses or other third parties (Teerling & Pieterson, 2010). It can occur offline (face-to-face) or online channels. The last one refers to e-government, namely the implementation of modern technologies by government agencies in order to communicate better and provide services to the citizens (Phang & Kankanhalli, 2008).

Prior research has pointed out some advantages of digital communication with the municipality. For citizens, using e-government would mean saving on travel or transaction costs, performing operations much quicker and accessing municipality services 24/7. For the governmental agencies, the benefit mainly emerges in saving on personnel costs while offering more services to the citizens (Ahmad, Markkula, & Oivo, 2013; Al-Shafi & Weerakkody, 2010; Heeks, 2006; Rey-Moreno, Felício, Medina-Molina, & Rufín, 2018).

During the recent COVID-19 pandemic, the importance of e-government and all online services, in general, has increased significantly. Governments worldwide have adopted new online technologies to manage the crisis, while the pandemic has represented a digital challenge for some other countries. (United Nations, 2020b).

Belgian situation with the e-government adoption

Looking at the Belgian situation, according to the European Commission's report data, the penetration level, namely, the level of adoption of e-government, is underperforming. However, the digitalization level is in line with the European average. Thus, the report's authors advise the Belgian government to increase Awareness about e-Government services' availability and benefits (European Commission, 2020b).

The focus of the paper

I presumed it would be interesting to enter deeper into the matter and discover the reasons that hinder citizens from using e-government and get an idea on how to encourage citizens to follow e-governmental implementations. In order to do it, this specific research paper replicated the study conducted by Rey-Moreno et al. (2018) in the Belgian context. The researchers have proposed a dual model to understand the citizens' usage behaviour, consisting of inhibitors on one side, namely the factors that discourage individuals from using e-government technologies, and facilitators, on the other hand, motivators of adoption and continuous adoption utilization. Facilitators are represented by the construct of the UTAUT theory (performance expectancy, effort expectancy, social influence and facilitating conditions), which synthesizes the most important points of previous theories about facilitating user technology acceptance(Venkatesh, Morris, & Davis, 2003). As for inhibitors, the researchers included three main obstacles for the e-government adoption: resistance, habit and inertia.

In this paper, I adapted the model by adding some, in my opinion, important constructs. First, I included one facilitator, Perceived fear, described as the perceived risk of being affected by the Covid-19 disease. I presumed that people would instead use digital means of communication because of the fear of going out and getting infected. Second, I added an inhibitor, Perceived risk. Because

citizens need to share a great part of their personal information while carrying out the operations through e-government, I supposed that they might be concerned about privacy and security. Third, I inserted two moderators, Awareness and Technology anxiety, between the constructs of UTAUT and the usage of e-government.

Methodology

After creating a questionnaire on Qualtrics, I distributed it through social media and the university's distribution service. The focus was mainly on citizens from 4 Belgian cities: Beringen, Diepenbeek, Antwerp and Brussels. After the data cleaning and reorganization part, a total of 146 valid responses were included in SPSS. Then the analysis process has begun. First, data were checked for normality. Then, I performed construct validity and reliability analysis. Before proceeding with hypotheses testing, a correlation matrix was executed to identify any high potential correlations between the independent variables.

Main findings

*Effect of Facilitators and Inhibitors on Continuance to use e-government*

After running the multiple regression analysis, I discovered that only one facilitator out of five positively influenced the willingness of citizens to use e-government, the Performance expectancy construct. Thus, the citizens believe that the e-government system is useful in their lives and increases the quality of the services offered by the municipality. This fact inspires people to continue using electronic administration.

As for the inhibitors, I found out that only Resistance contributes significantly to users' unwillingness to continue using e-government services. Resistance is a deliberate choice of favouring a channel of communication, even if faced with a better solution. Other factors, included Perceived risk, did not produce any significant influence on the citizens' usage.

*Effect of Awareness on the relationship between Performance expectancy and Continuance to use e-government*

Awareness is the construct that aims to assess how much citizens are familiar with the e-government services and their benefits (Alawneh, Al-Refai, & Batiha, 2013). The idea behind placing Awareness between performance expectancy and willingness of citizens to adopt e-government is the following: if citizens received enough information about how to use e-government and its benefits, it would help them understand how it is helpful and useful in their lives. Hence, it would increase their e-government usage.

In order to see the change that Awareness would produce if added to the previous model, I performed the hierarchical regression analysis. The outcome has shown that neither the main term nor the interaction term produced any significant changes to the model, and they did not work as predictors of the increased usage of e-government.

*Effect of Technology anxiety on the relationship between Effort expectancy and Continuance to use e-government*

Venkatesh et al. (2003) has defined Technology anxiety as a fear of any technological system. It could be connected to losing information because of some system error or personal fault (for

example, hitting the wrong button). In this paper, I proposed it as the moderator between effort expectancy and the willingness of citizens to continue using e-government. Thus, I hypothesized that with the increase of psychological anxiety for using the technology, the effort to use e-government would be perceived much greater, discouraging an individual from using the online services proposed by the municipality. However, Technology anxiety had no significant influence, neither as a main term nor an interaction term.

*City size, gender and age groups*

Age and gender represent confirmed moderators of the UTAUT model. The results of the t-test made me confirm the hypothesis that there are no significant differences in e-government usage between men and women. As for the age groups, the outcome was different from most studies (Alomari, Sandhu, & Woods, 2014; Solvak et al., 2019). According to the ANOVA test, there was no significant difference between different age groups and their usage of e-government.

I also analysed the different usage behaviour in the cities of Belgium. The idea was to find out if the usage of e-government can be greater in the municipalities with a larger total population and total density compared to the smaller municipalities. However, the results have shown that there is no significant difference between these cities in the willingness of the citizens to continue using e-government.

Limitations of the research

This research paper focused on the local level, considering some municipalities of the Belgian provinces. Thus, the results should not be generalized to represent the country. The greatest limitation of this research is the lack of a representative sample of the non-users model (n=26), which made it impossible to test a great part of the hypotheses.

Practical implications

It was found that even if user citizens agree that e-government is useful and helpful, it is not always easy to perform all the procedures from different devices. Consequently, it could be inconvenient for the citizens to communicate with municipalities digitally. Public administration could improve e-government platforms: making them easier to access and more comprehensible would probably increase e-government usage. Moreover, it could also decrease the citizens' resistance against new technologies if they were more user-friendly.

## Contents

## 1. Introduction

In most modern countries, government institutions provide a wide range of communication instruments for information exchange with the citizens, businesses or other third parties (Teerling & Pieterson, 2010). It can occur offline (face-to-face) or online channels. The last one refers to e-government, namely the implementation of modern technologies by government agencies in order to communicate better and provide services to the citizens (Phang & Kankanhalli, 2008).

During the recent COVID-19 pandemic, the importance of e-government and all online services, in general, has increased significantly. Governments worldwide have adopted new online technologies to manage the crisis, while the pandemic has represented a digital challenge for some other countries. United Nations has considered the current situation of the worldwide e-government development in the UN e-Government surveys 2020. The information about the countries' performance relative to each other is gathered in the EGD index. It is based on three aspects of e-government: the ability to provide online services, quality of telecommunication connectivity and human capacity. In regard to Belgium, despite its index, which is higher than the average in the world, the country's rank has decreased in two years, dropping from 27th place (2018) to 41th (2020) (United Nations, 2020b).

Besides the pandemic, prior research has pointed out some positive sides of the digital communication between the municipality and its citizens. One of the advantages for government agencies is providing service at the reduced costs, as electronic channels are cheaper than the traditional ones (Teerling & Pieterson, 2010). On the other hand, citizens' advantage is to avoid long queues and, in general, save some time (Rey-Moreno et al., 2018).

The example of Russia's capital, Moscow, is a comprehensive way of understanding how e-government can positively influence citizens' life. In 2010 the city was still far away from digitalization, and people were used to staying in long lines to get any kind of governmental service. In order to get one document, a person could spend a whole day going from one department to another, following complicated administrative procedures. In 2018 things changed, as many digital technologies were included in the government administration's management system. This electronic development has made citizens' lives easier, as they could solve many bureaucratic problems directly from the mobile phone or computer, using one of the ten applications currently available in the country for online e-government services (National Research University Higher School of Economics, 2020).

Nevertheless, despite the positive effects of e-government, citizens' use of digital forms of service seems quite limited (Rey-Moreno et al., 2018). It regards Belgium as well. According to the European Commission's report data, despite the Belgian digitalization level, which is in line with the European average, the penetration level, namely, the level of adoption of e-government, is underperforming. The report provides the factors measuring this indicator, which, curiously, are in line or reach even higher levels than the average European number. Thus, the authors of the report advise the country to increase awareness about the existing e-services (European Commission, 2020b).

However, analysing the internal reports concerning the e-government adoption of the country, the picture looks different. Eurostat dates state clearly that the percentage of people who used the

internet to interact with public authorities grew steadily throughout the years, from 45% in 2010 to 59% in 2019. Moreover, only 22% of Belgian citizens were submitting official forms through online channels in 2010. This percentage grew up to reach 40% in 2019 (Eurostat Information Society Indicators, 2020).

Thus, from the first glance, it seems that the adoption of e-government by Belgian citizens grows slower than in many other countries. Hence, it would be interesting to investigate what are the factors that influence this phenomenon. As well as what are the possible aspects that can increase the citizens' willingness to adopt the information technologies offered by e-government. Indeed, this research aims to understand the elements that could increase the citizens' intention to use e-government.

This research paper will focus on the local level, considering some municipalities of the Belgian provinces. The results may be insufficient to represent the country, but they may be important to give the local administration agencies some insights on how to encourage citizens to follow e-governmental implementations and help them to achieve their aims.

Different researchers have analysed the problem from various points of view. For instance, 1) by studying the correlation between the trust in the local government body and the e-participation (Kim & Lee, 2012), 2) by examining different external environmental factors, such as economy, level of education of citizens, democracy, and their influence on e-participation (Zheng & Holzer, 2013) or 3) by taking into account the perspective of municipalities and their willingness to motivate citizens to utilize ICT offerings (Zheng & Schachter, 2017).

Instead, this research paper will focus on Rey-Moreno et al. (2018)'s example and follow the dual model idea presented in their work. The model consists of inhibitors on one side, namely the factors that discourage individuals from using e-government technologies, and facilitators, on the other hand, motivators of adoption and continuous utilization. In order to introduce and describe the facilitators, the researchers have considered the Unified Theory of Acceptance and Use of Technology (UTAUT), which synthesizes the most important points of previous theories about facilitating user technology acceptance. As for inhibitors, the paper relied on different models, presenting three main obstacles for the e-government adoption: resistance, habit and inertia.

Other constructs will be added to this study. The first one is a facilitator, Perceived fear. It will be hypothesised to increase the willingness of citizens to use digital means of communication due to the fear of going out. Awareness will work as a moderator between one of the UTAUT constructs, performance expectancy, and e-government usage. If citizens received enough information about how to use e-government and its benefits, it would help them understand how it is helpful and useful in their lives. As for the inhibitor, perceived risk will be proposed to affect citizens' willingness to adopt e-government negatively. Also, the difference of usage will be assessed between genders, age groups and different city sizes.

Consequently, this research paper will try to answer the main question: to what extent do the proposed facilitators and inhibitors influence the willingness of citizens to adopt or to continue using e-government?

## 2. Literature review

### 2.1. E-government definition and its stages

Researchers argue that e-government does not have a precise definition, as it is a vast concept. It connects and includes different elements, such as "IT System", "Administration", "Management", "Development", "Framework", "Service", "Citizens", "Business", "Integration" (Hu, Pan, Lu, & Wang, 2009). In this paper, a general definition will be given to e-government, and its multiple concepts will be explained throughout the text. Thus, e-government is generally defined as the implementation of modern technologies by government agencies in order to communicate better and provide efficient services (Akkaya, Jakob, & Krcmar, 2019; Phang & Kankanhalli, 2008). Governments typically operate on five potential levels of e-government: local, state or provincial, regional, national and international (Heeks, 2006).

The transition from government to e-government requires continuous development and improvement. It involves different stages, which are integrated into a model (Baum & Di Maio, 2000):

- Web presence or Information (Soliman, Affisco, Belanger, & Hiller, 2006): transmission of information through a website to the general public. It is characterized by one-way interaction. Hence citizens are not able to respond digitally to the administrative entity at this stage.

- Interaction or two-way communication through request and response (Moon, 2002; Soliman et al., 2006): this phase allows a person to have basic interaction, for instance, through e-mails or official pages for downloading official forms.

- Transaction: this stage is represented by a more advanced way of interaction between the government and the citizens, in which the latter can conclude important transactions, such as uploading or obtaining certificates or other documents, as well as paying taxes.

- Transformation or Integration (Jayashree & Marthandan, 2010; Soliman et al., 2006) requires government entities to completely adapt their internal processes to a digital system. Some researchers identify two types of integration: a) vertical, referring to the integration of services at different levels, for instance, at local or state level; and b) horizontal, namely the transformation of the systems at the department level (Layne & Lee, 2001).

Jayashree and Marthandan (2010) identify another stage, e-society, a fully integrated digital framework, which may include education system, banking, e-business, service provision related to health, e-democracy and other societal activities. It also includes communication with external elements, namely, stakeholders, described later in this paper.

### 2.2. Functions of e-government

E-government functions have been divided into four main dimensions (Dawes, 2002):

- **E-services**: information and services provided by digital means to citizens, businesses or other components of e-government, such as non-profit organizations or other administrative agencies.

- **E-democracy**: concerning the citizens' participation in the decision-making process. This dimension is also called e-participation. As examples of e-participation, group chats or forums, electronic voting systems, blogs, or participatory budgeting platforms can be mentioned (Naranjo-Zolotov, Oliveira, & Casteleyn, 2019).
- **E-commerce**: all the activities concerning the money exchange between the government and other components of e-government. More often, e-commerce refers to the interactions between the government and businesses, and it also can be called e-collaboration (Yildiz, 2007).
- **E-management**: all the activities committed to smooth operations and services outside or inside the administrative entity.

Another way to describe how the governments provide services is to divide the functions according to the time horizon: short-term, mid-term and long-term provision. In order to assure a long-run future service provision, governments continuously invest in up-to-date technologies and the development of digital infrastructures. Mid-term service provision is about technology education and technological or financial support to the local administrative departments. In order to make it all possible, governments need to be involved in a partnership with third parties or stakeholders, such as private companies, international organizations or other government agencies. Lastly, the short time interaction is represented by the use of websites, social media or other online platforms for prompt information sharing. It involves direct communication with citizens and e-participation and digital protection regarding data privacy or unwanted consequences of technology (United Nations, 2020a).

### *2.2.1. Adoption of new technologies by the Governments*

During the recent pandemic outbreak, some governments have decided to react quickly and integrate new technologies to help their citizens overcome these difficult times. Numerous solutions, such as artificial intelligence, 3D printing and robotics, have been utilized in order to improve health service efficiency. Many of them were offered by private IT companies. However, an effective public administration and strong government leadership were essential for implementing digital solution projects (United Nations, 2020a). Some of the most striking examples are provided below.

In Croatia, a "virtual doctor" powered by AI technology has been launched. The Croatian government led this project, but many other private companies participated as well, free of charge. The efficiency of such a "doctor", developed with the cooperation of epidemiologists, is relatively high, as it can manage to assist thousands of patients every day and provide personalized health advice (Government of the Republic of Croatia, 2020).

An Italian start-up has used 3D printing technology to create replacement valves for ventilators. The first pandemic wave has impacted the country heavily, and all the hospitals faced shortages of the essential elements for the reanimation devices. The Italian government needed to react quickly, and so it sent a distress signal through the newspapers. The message caught the start-up company's attention, which came up with innovative technological solutions and helped the hospitals save many citizens (World Economic Forum, 2020).

Robots are employed as well by many governments to complement the efficiency of the service provision. Some of the robots were positioned at airports or other public places and by using thermal recognition technologies, they could quickly identify people with fever. Other robots have been used for the sterilization and disinfection of contaminated areas. Their "smaller brothers", drones with the ultraviolet system, have been used for the same purpose, as well as for delivering medical supplies and making sure that all the citizens are staying at home and do not go out, except for extreme necessities (Royal Oman Police, 2020).

### *2.2.2. Components of e-government*

Previous research papers focus attention on the citizens-related services provided by the government. It is also going to be the main topic of this specific paper. Nevertheless, it could be useful to understand that e-government includes other components as well. These partnerships with external elements can help the government get the necessary financial and human support to provide efficient and quick service (United Nations, 2020a). For instance, Graafland-Essers and Ettedgui (2003) identified three types of digital interactions: between government and citizen (G2C), between government and businesses (G2B) and between government and other government agencies (G2G). Later on, in his research paper, Heeks (2006) added another stakeholder: non-profit organizations (G2N). This component was also supported by Rico-Pinto and Sánchez-Torres (2019). Twizeyimana and Andersson (2019) argue that governments operate on another internal level as well, establishing relationships with employees (G2E). Literature offers different names and definitions for these relationships; however, the researchers agree that all these dimensions should not be seen as separate parts. On the contrary, it is an integrated framework that composes the structure of e-society (Jayashree & Marthandan, 2010). Some researches divided e-government services in different dimensions: 1) e-Administration – referring to the internal processes realized mostly among administrative departments; 2) e-citizens -

As an example of different definitions, Soliman et al. (2006) developed a framework that takes another perspective of governments' relationships and their components. The researchers suggest that the use "2" (to) is generally associated with business relationships with customers (B2C) or with other businesses (B2B). In this way, the scholars propose using a small letter "w" instead of "2" to create a new association connected to government relationships. For instance: the government relationship with individuals for delivering services is "GwIS". The author of this paper finds fascinating the new approach to describe e-government interactions. Nevertheless, this suggestion has not been accepted by researchers and scholars. Thus, to avoid confusion, the traditional way of defining the relationships ("2") will be used from here on.

**G2C**: Involves two-way communication with normal citizens in terms of service or information delivery (Soliman et al., 2006; Yildiz, 2007). The major part of the literature is dedicated to the research on citizens' adoption of e-government and on the benefits that it could bring to them. It will also be the main focus of this thesis as well, the reason for which these two topics will be described in separate sections later on.

**G2B**: As seen in the section "adoption of new technologies", governments need to collaborate with the private sector to ensure the provision of services. However, the digital government also creates services specifically for businesses. This subcategory of e-government may also be called e-commerce or e-collaboration (Yildiz, 2007). When Graafland-Essers and Ettedgui (2003) surveyed e-government services across the European countries, the results have shown that only one-third of the companies choose to interact with the administrative office through the e-government. Most of them were using e-government services for payment of contribution for employees or for declaration of VAT or taxes, namely the services that require confidential and personal information. Just a few businesses used the digital services of the government for simple information exchange.

Compared to the current situation, services concerning regular business operations are in the first place for online availability and usability. As the results show, 77% of the businesses use digital services for their daily operations, such as the declaration of taxes and submission of financial reports or use services regarding employees' working conditions. This percentage is followed by 76% of the citizens that use the e-services to register the company, obtain the registration number and request permits (European European Commission, 2020a)

**G2G**: Government entities at different levels, for instance, federal, state and local agencies, obviously communicate digitally with each other as well (Soliman et al., 2006). G2G was defined as "*collaboration of two or more governments or governmental agencies sharing information and cooperating with one another through the Internet, Extranet, disks, EDI, phone, and/or other electronic tools; it can lead to effective service and the realization of the monitoring goals*" (Fan, Zhang, & Yen, 2014, p. 120) and it may also be defined as e-administration (Yildiz, 2007). This relationship has been studied less by researchers than G2C and G2B. However, it represents the foundation of e-government. To provide valuable digital services to the citizens and businesses, an efficient network that connects each governmental agency of every level needs to be implemented. Integrating every governmental entity into the system at technological, semantic and organizational levels has a name of G2G interoperability (Rico-Pinto & Sánchez-Torres, 2019). Heeks (2006) agrees that an improvement in the e-government service provision would likely reflect the change in the internal government processes.

**G2N**: Non-profit organizations, as the name may suggest, do not work for profits but for the social cause in different areas, such as research, science, religion, education and others. Previous literature did not focus too much attention on describing the relationship between government and non-profit organizations. Some of the available research is described below. Lin (2019) emphasizes that the government should put significant effort into digitalizing social organizations. More specifically, governments should encourage non-profit organizations to optimize online services, promote data management and sharing, and realize online law enforcement monitoring. Rowley (2011) lists some benefits related to this specific element of the government relationship, namely: transparency, openness, trustworthiness, accessibility, inclusivity and lastly, democracy.

**G2E**: Previous research studied this interaction mostly from the government employees' point of view and their willingness to adopt the e-government systems. The results have shown that in order to accept the new e-government technologies, an employee should perceive the technology as a real help in improving his/her performance (performance expectancy); or as a useful tool to make the

work easier (facilitating conditions). Together with attitude, these two elements are the most successful predictors for the employees' acceptance to use the digital government.

#### *2.2.3. E-participation*

E-participation is defined as a "branch of e-government with special focus on citizen engagement for deliberation and decision orientation"(Naranjo-Zolotov et al., 2019, p. 364). This process occurs through different forms of information and communication technologies (ICT), always improving to provide citizens with the latest technologies and increase communication efficiency with government establishments. As an example of e-participation, the authors mention group chats or forums, electronic voting systems or blogs. Another example could be the online participatory budgeting platforms (Sintomer, Herzberg, Allegretti, Röcke, & Alves, 2013). The governments use those platforms to allow citizens to participate in a decision-making process over the public budget.

As for the situation in Belgium, if compared to other countries, it can be stated that the e-participation levels of Belgian citizens grow slower than the European average. It can be spotted by consulting the United Nations' public webpage dedicated to the Division for Public Institutions and Digital Government. E-Participation Index here is defined as an extension of the UN E-Government Survey that focuses *"on the use of online services to facilitate the provision of information by governments to citizens ("e-information sharing"), interaction with stakeholders ("e-consultation"), and engagement in decision-making processes ("e-decision making")*". In 2020 Belgium was ranked at 77th place among 193 countries. Compared to 2018, the country was at 59th place, and in 2010, Belgium was at 17th place (United Nations, 2020b). The reasons for this change were not explained in the report. The author of this paper can identify two possible interpretations of this phenomenon. First is that the e-participation of Belgian citizens has dropped considerably throughout the years. The second is that the European countries progressed more than Belgium in terms of the e-participation levels.

### 2.3. Adoption of e-government by citizens

#### *2.3.1. The current situation compared to one decade ago*

More than a decade ago, previous research stated that communication through the internet between governments across Europe and their citizens was relatively rare (Heeks, 2006; Horrigan, 2005). At the time, the estimations pointed out that a maximum of two-thirds of the industrialized countries' population has accessed e-government. This number was much lower in developing countries, indicating a minimal share of citizens accessing e-government (Accenture, 2004; Heeks, 2006). Kumar, Mukerji, Butt, and Persaud (2007) argued that at the moment, the percentage of e-government users in the world was just about 30%. As for the e-services, the literature specified that only 5-10% of all the transactions were embraced digitally (Heeks, 2006). The researchers have emphasized the necessity of further research on the factors that could positively or negatively affect the adoption of e-government (Bélanger & Carter, 2008; Kumar et al., 2007).

As of the present moment, the data show that the situation is slightly different. By the year 2020, more than half (60%) of European citizens chose online services of e-government for different reasons, such as: for moving (71%), for losing or finding a job (71%), for studying (68%), for family (63%), for owning and driving a car (62%) or for starting a small claims procedure (57%). (European European Commission, 2020a).

Many studies have been conducted throughout the years, trying to access the possible effects of different factors on citizens' intention to adopt e-government. Some of them, older studies and newer ones, will be described later on.

### *2.3.2. Benefits of e-government adoption*

According to the literature, the benefits of adopting e-government could be divided into five blocks:

- Cheaper: the financial benefit was found to be an opportunity not just for the citizens and businesses (Ahmad et al., 2013; Al-Shafi & Weerakkody, 2010; Rey-Moreno et al., 2018), but for the administrative entity as well, in terms of reduced cost structure (Alawneh et al., 2013; Heeks, 2006). Indeed, while the citizen or a private business can save on travel costs, transactions or intermediary fees, the government agencies may save on human or other resources (Heeks, 2006).
- Quicker: having the possibility to assist and help more citizens simultaneously is considered the greatest advantage for the administrative entity (Heeks, 2006). Indeed, the traditional way of providing services is considered slower if compared to e-government (Jayashree & Marthandan, 2010). However, the researchers argue that not every interaction with e-government will offer the same time-saving opportunity (Kumar et al., 2007). Nevertheless, generally, e-government services allow the citizens and the businesses to forget long queues and complete the interaction operation with the municipality much faster (Ahmad et al., 2013; Pappa & Stergioulas, 2006).
- More convenient: intended in terms of flexibility and access (Alawneh et al., 2013; Pappa & Stergioulas, 2006). Indeed, a great advantage of e-government is to benefit from the services every hour of the day and every day of the week, without waiting for the administrative building's opening hours (Al-Shafi & Weerakkody, 2010). Some operations may also be paused and resumed later, when more convenient (Kumar et al., 2007).
- Simpler: simplification of the procedures compared to the traditional way of service provision was also mentioned in previous research (Ahmad et al., 2013; Heeks, 2006; Pappa & Stergioulas, 2006). Indeed, the problem of high bureaucracy that characterizes municipalities and administrative agencies' way of working is possible to overcome thanks to e-government (Jayashree & Marthandan, 2010).
- New: meant in terms of new possibilities for the municipalities, for instance, to build trust with the citizens, to help the businesses keep growing or to create more interest towards the government activities (Al-Shafi & Weerakkody, 2010). Indeed the e-government is considered as more transparent (Alawneh et al., 2013), with fewer chances of favouritism (Alomari et al., 2014) and in general with fewer possibilities to make a mistake during a procedure (Pappa & Stergioulas, 2006).

### *2.3.3. E-government studies*

Literature has largely tried to explain the effectiveness of e-government activities and services and methods for increasing the adoption of these services by the components of e-government.

One of the older studies, conducted by Graafland-Essers and Ettedgui (2003), accessed general knowledge of citizens and businesses about the e-government services, their intention to use such services and their "post-purchase" experience. According to the research, those elements are strong indicators of the success of e-government. The outcome indicated that previous experience with the internet and online application significantly influences the willingness to accept and use e-government. Overall, citizens who evaluated the digital services as more convenient in terms of time than the traditional government assistance perceived more positively the use of e-government. Moreover, the final results have shown the importance of using services that would not reveal citizens' personal information. A recent study arrived at a similar conclusion. According to the scholars, many citizens are unwilling to save their private documents on the account dedicated to e-government activities (Akkaya et al., 2019).

In another study, Heeks (2006) developed a "government value chain", integrating all the necessary elements for measuring the organizational goals. Adoption and use of e-government services by citizens is a fundamental part of this value chain framework.

In general, the framework is composed of four parts:

1) Readiness of the government to embrace digital transformation. The governments need to possess an efficient network of different types of infrastructure: legal, institutional, human, technological, data systems, and strong leadership power. The presence of such inputs as money, political support and labour are also indicators of the government's readiness to develop best practices. And lastly, the existence of an effective strategy.
2) Availability of necessary intermediates, such as web channels, back-office systems or others.
3) Uptake: the citizens' general attitude towards the services developed by the e-government, expressed through adoption and use of those services.
4) Impact: according to this framework, the results are measured through citizens' level of satisfaction after a certain service has been received. Financial and time-saving indicators also measure the impact.

An improvement in the functionality of one part of this framework leads to the greater efficiency of the next one (Heeks, 2006).

In order to understand the gap in the literature, previous research has been studied with great attention. The summaries of the objectives and outcomes are organized below in Table 1.

Table 1. Previous studies regarding the e-government adoption

| Researchers | Objective of the study | Approach | Main findings |
|---|---|---|---|
| (Ahmad et al., 2013) | To identify the enablers and limitations to the | Survey | The UTAUT constructs (performance and effort expectancy, social influence and facilitating |

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|---|---|---|---|
| | adoption of e-government by Pakistani citizens | | condition) were found to be significant influencers on e-government adoption. On the other hand, the limitations were lack of awareness or assistance, poor infrastructure or user interface, and data privacy. |
| (Al-Shafi & Weerakkody, 2010) | To determine the factors influencing the adoption of e-government in Qatar | Survey | Some of the UTAUT constructs (performance expectancy, social influence) and behavioural intentions were the main predictors for the use of e-government. As for the demographic elements, there was no significant difference between the gender and the education of the participants |
| (Al-Mamari, Corbitt, & Gekara, 2013) | To understand what are the motivators of governments digitalization (example of Oman) | Qualitative research | Governments of Oman adopted e-government 1) because of the normative and coercive regulations imposed by international organizations (e.g., UN, IMF…); 2) to improve the quality of service provision; 3) to develop IT knowledge and diversify the economic resources |
| (Alawneh et al., 2013) | To find out the determinants of the citizens' satisfaction in using e-government platform in Jordan | Survey | Three main factors explained the Jordanians' satisfaction to use e-government: accessibility of the e-government portal, awareness of existing services, and their quality of provision. |
| (Alomari et al., 2014) | To determine the limitations to the citizens' e-government adoption in Jordan | Qualitative research | Trust in the internet, religious view, lack of computer skills, financial inability, WOM, Wasta (traditional transactions increase the chances of favouritism), resistance to change and relative advantage (accuracy) were found as the main barriers for e-government adoption in Jordan |
| (Alzahrani, Al-Karaghouli, & Weerakkody, 2017) | To identify the factors that could influence the trust of the citizens in e-government adoption | Critical and systematic literature review | Technological (system quality, service quality and information quality), governmental (reputation of the agency, past experience) as well as risk (performance, time, security and privacy) factors, together with personal characteristics of the citizens, are the most important determinants for the trust in e-government and, consequentially, for e-government adoption |

| | | | |
|---|---|---|---|
| (Carter & Weerakkody, 2008) | To compare the U.S literature findings of e-government adoption with the U.K. survey outcomes | Survey | Citizens who understand the digital government's advantages over the traditional one were more likely to use the e-services. The trust in the government was discovered to be a positive driver for the adoption as well. These findings were in line with the U.S. literature |
| (Kumar et al., 2007) | To propose a conceptual model on e-government adoption in Canada | Literature review | The adoption of e-government depends on the website design elements, citizen's characteristics and the existence of previous experience with the internet |
| (Mensah & Mi, 2019) | To investigate the indicators for readiness to use e-government by the citizens | Survey | The citizens are more willing to use e-government if they perceive the quality of the service and efficiency of its delivery, and the transparency and accountability of the government (TAG). Moreover, age was a factor determining the users' self-efficacy, which, in turn, impacted the willingness to use e-government. |
| (Rey-Moreno et al., 2018) | To determine the factors that enhance and limit the e-government adoption | Survey and qualitative research | For the non-users, the main predictor of the intention of use is the "Performance expectancy". The inhibitor, instead, is the habit. For the users of e-government, the main drivers to continuous use of e-services are "performance expectancy" and "effort expectancy". The limitations are "habit" and "resistance". |
| (Schaupp & Carter, 2010) | To access the influence of trust, perceived risk and optimism bias on the e-filing | Survey | Perceived risk diminishes the chances of adoption of e-government by the citizens, but the perceived trust of the internet increases it by decreasing the risks |
| (Sawalha, Al-Jamal, & Abu-Shanab, 2019) | To find out the factors that could influence the intention to use the Facebook page of the government as a surrogate of e-government website | Survey | The UTAUT2 constructs (performance and effort expectancy, social influence and enjoyment) and personal innovativeness contribute to the adoption of e-government through the Facebook page of the government |
| (Sharma, 2015) | To discover what service quality elements and demographic dimensions | Survey | The willingness to use e-government is equal for men and women, but it decreases with age and increases with education. As for the service quality, reliability, security, efficiency |

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|---|---|---|---|
| | would influence the adoption of e-government | | and responsiveness have a significant positive impact on using e-government. |

### *2.3.4. Belgian situation with the adoption of e-government*

The most recent and probably the most reliable benchmarking report about e-government is written by the European Commission, which is based on the evaluations of more than ten thousand websites from 36 countries worldwide. (European Commission, 2020a). In the paper, the performance indicators for e-government are indicated for each country, and the possible factors influencing those indicators are reported as well. To measure the extent to which e-services are adopted by the citizens, businesses, and other government components, the European Commission uses the indicator "Penetration". This element is obtained by calculating the number of people that submitted the official forms through digital means to the administrative entity in the last year. The factors explaining the "Penetration" indicator were identified to impact it (coefficient of determination between 20% and 35%). Those are:

- **Users' characteristics**: composed of "Digital skills" needed to exploit the utilities offered by modern technologies, and "ICT usage" that indicates the overall ability and willingness to use the internet and its different platforms.
- **Government's characteristics**: takes into consideration "Quality", referred to the quality of regulations towards the private sector development, quality of livability (probability of criminal activity), quality of service effectiveness and reputation of the government. This indicator also considers the "Openness" factor, which has a relatively low impact on the "Penetration".
- **Context characteristics**: measured through "Connectivity", the likelihood of necessary infrastructure and its effectiveness, and "Digital in the private sector", explained as the private businesses' digitalization.

Looking at the Belgian situation, it is noticeable that the "Penetration" indicator is much lower than in the European countries, similar to Belgium in terms of general conditions (European Commission, 2020b). However, the factors explaining this indicator are in line or reach even higher levels than the average European number. The authors of the report do not give further explanation about this phenomenon and conclude the considerations by advising to "improve Penetration level by raising citizen awareness about eGovernment services availability and expanding the number of online users" (European Commission, 2020b, p. 11).

## 2.4. Variables and hypotheses

How is it possible to expand the number of online users? One possible solution could be studying the factors that would make citizens become users (if they are not) and limiting them from doing it. Alternatively, by researching why the existing users exploit the e-government and what barriers they perceive using it. Previous research focused attention on both of these kinds of citizens, users and non, and both kinds of factors that might influence (positively or negatively) their interest in the use of e-government. The scholars have found that the main motive for the non-users citizens not to utilize the e-services is the habit of using the traditional way of communication with the government.

On the other hand, the factor "Performance expectancy" would increase their intention to start using the online service offered by the government. For the users' segment, "Performance expectancy" also influenced the reason to continue using the e-services, together with another factor, "effort expectancy". In this case, the habit of using the electronic channel played an important role in the continuance of using it. (Rey-Moreno et al., 2018).

This specific research paper will replicate the study conducted by Rey-Moreno et al. (2018) in the Belgian context. The UTAUT constructs will be used for measuring the positive intention to adopt the e-government. However, this research paper hypothesizes that the effect of performance expectancy could be positively moderated by awareness of the government's existing e-services. Previous research has already focused on the power of awareness to study citizens' satisfaction in using online government services (Alawneh et al., 2013) or to state that lack of awareness leads to lower e-government adoption (Ahmad et al., 2013; Carter & Weerakkody, 2008). In this research, the citizens' awareness about the e-services and the benefits they can bring is expected to enhance the performance expectancy of the e-government, which will increase the willingness of citizens to adopt or continue to use e-government.

Moreover, an extra facilitator has been added, the "perceived fear" of Covid-19 disease. Due to the recent spread of the infection, not much research has been done on e-government adoption. This paper aims to cover this gap by investigating the possible positive influence of this psychological fear of Covid-19 on the increased usage of e-government services.

As for the inhibitors for adopting e-government, in addition to those proposed by Rey-Moreno et al. (2018), namely resistance, inertia and habit, another possible factor, suggested by the literature, could be "Perceived risk", defined as the unwillingness of providing personal information through digital means due to the fear of privacy violation. The perceived risk was previously studied to affect the trust in e-government (Alzahrani et al., 2017; Schaupp & Carter, 2010), and it was shown to have an important role for the citizens' behavioural intentions (Akkaya et al., 2019; Graafland-Essers & Ettedgui, 2003).

Apart from the confirmed moderators of the UTAUT model, such as personal demographical characteristics, which influence the relationship between the facilitators and citizens' intention to use technology, some other variables were added (Venkatesh et al., 2003).

As mentioned before, awareness is assumed to have a positive moderating effect between performance expectancy and the willingness of citizens to use or to continue using the e-government. On the other hand, technology anxiety might negatively affect effort expectancy and the willingness to use e-government. Thus, it is hypothesized that with the increase of psychological anxiety for using the technology, the effort to use e-government would be perceived much greater, discouraging an individual from using the online services proposed by the municipality. Lastly, the city size is presumed to influence positively the relationship between the facilitating conditions and the intention of the individuals to use e-government.

### *2.4.1. Facilitators*

UTAUT

The unified theory of acceptance and use of technology was first proposed by Venkatesh et al. (2003). It was created by analysing eight different models, namely the Theory of Reasoned Action (TRA) (Davis, 1989), the Technology Acceptance Model (TAM) (Davis, 1989), the Motivational Model (MM) (Davis, Bagozzi, & Warshaw, 1992), the Theory of Planned Behaviour (TPB) (Ajzen, 1991), the combination of TAM and TPB (Taylor & Todd, 1995), Model of PC utilization (MPCU) (Thompson, Higgins, & Howell, 1991), innovation diffusion theory (IDT) (Rogers, 2002), and social cognitive theory (SCT) (Compeau & Higgins, 1995), on technology acceptance and combining them in one framework. According to the framework, four independent variables significantly affect the dependant variables "Behavioural intention" and "Usage". They are explained as follows:

1) **Performance expectancy**: is defined as "the degree to which an individual believes that using the system will help him/her to attain gains in job performance" (Venkatesh et al., 2003, p. 447). It was identified as the strongest predictor of intention. For this factor, there are two moderators, gender and age. More specifically, it was proven that younger men, who perceived the technology's usefulness in improving their job performance, had a greater intention to adopt this technology. Performance expectancy can be evaluated through five scale items: Perceived usefulness, Extrinsic motivation, Job-fit, Relative advantage, Outcome expectations. Following the framework construct definition, two hypotheses are formulated:

*H1: Performance expectancy will positively influence the willingness of non-users citizens to adopt e-government services.*

*H2: Performance expectancy will positively influence the willingness of users citizens to continue using e-government services.*

2) **Effort expectancy**: is defined as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450). The authors stated that three moderators influenced the relationship between effort expectancy and behavioural intention: gender, age and experience. Thus, there was found a stronger relationship for older women with less experience. The scale items for this construct are Perceived ease of use, Complexity and Ease of use. Therefore, two additional hypotheses will be as follows:

*H3: Effort expectancy will positively influence the willingness of non-users citizens to adopt e-government services.*

*H4: Effort expectancy will positively influence the willingness of users citizens to continue using e-government services.*

3) **Social influence:** is "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451). However, it was found that this factor is significant only if the gender, age, voluntariness or experience moderators are included. In order to measure the social influence indicator, three items were described: Subjective norm, intended as the influence of the most important people, Social factors, explained in terms of social and cultural influence, and Image. Hereafter, two more hypotheses were proposed:

*H5: Social influence will positively influence the willingness of the non-users citizens to adopt e-government services.*

*H6: Social influence will positively influence the willingness of users citizens to continue using e-government services.*

4) **Facilitating conditions**: is "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system" (Venkatesh et al., 2003, p. 453). It is significant only if considering the moderating effects of age and experience. Hence, the construct influences the behaviour only of older people with more experience. It includes three main scale elements: Perceived behavioural control, Facilitating conditions and compatibility. Hence, these two hypotheses to support the model were formulated:

*H7: Facilitating conditions will positively influence the willingness of non-users citizens to adopt e-government services.*

*H8: Facilitating conditions will positively influence the willingness of users citizens to continue using e-government services.*

Perceived Fear

The effect of the fear of Coronavirus on the willingness of students to adopt Google Meet has been analyzed by the researchers Al-Maroof, Salloum, Hassanien, and Shaalan (2020). The scholars have concluded that because of the high degree of anxiety for personal health and the health of the loved ones, many people were more eager to use online communication tools, such as Google Meet.

Another study has examined the fear of the Coronavirus as a moderator between the constructs of the UTAUT model and the behavioral intention of the learning management system. They have found that the corona fear moderates the relationship between the performance expectancy and behavioral intention and between the social influence and behavioral intention (Raza, Qazi, Khan, & Salam, 2021).

However, due to the very recent appearance of the Covid-19 disease, no research has been done regarding the influence of fear of being affected on the willingness of citizens to use e-government. This paper will fill this gap by adopting the "perceived fear" that could be defined as the perceived risk of being affected by the Covid-19 disease, degree of anxiety for personal health, and health of the loved ones. The following hypotheses have been formulated:

*H9: Perceived fear will positively influence the willingness of non-users citizens to adopt e-government services.*

*H10: Perceived fear will positively influence the willingness of users citizens to continue using e-government services.*

### *2.4.2. Inhibitors*

Perceived risk

Previous research has shown that risk perception during online purchases can negatively influence the customer's attitude towards the webshop (van der Heijden, Verhagen, & Creemers, 2001). Poor knowledge of the new technologies (Zhang & Maruping, 2008) or a lack of trust in the internet (Alomari et al., 2014) normally leads to the unwillingness to use electronic means for a purchase. Generally, service differs from physical goods in at least two ways: it is very difficult or almost impossible to inspect the quality of the service before the actual purchase, and there is a big chance that the quality of service delivery will be different every time. The former characteristic of the service refers to its intangibility and the latter to its variability. Because of this particular nature of the services, the decision-making process's risk increases (Fahy & Jobber, 2015). What is more, the impersonal and unpredictable nature of the internet and the customer's small power over it may result in a limitation for the e-service adoption and lead to alternative channel usage (Pavlou, Tan, & Gefen, 2003).

Literature over e-government adoption suggests that perceived risk can negatively influence the trust in the government (Alzahrani et al., 2017; Schaupp & Carter, 2010) as well as the behavioural intentions of the citizen (Akkaya et al., 2019; Graafland-Essers & Ettedgui, 2003).

In this paper, perceived risk will be analysed through the "concerns about privacy and security" and "risk of providing personal information" construct items used in the research conducted by Schaupp and Carter (2010). Based on what has been mentioned, the hypotheses are formulated as follows:

*H11: Perceived risk will negatively influence the willingness of non-users citizens to adopt e-government services.*
*H12: Perceived risk will negatively influence the willingness of users citizens to continue using e-government services.*

Inertia

Previous research has analyzed inertia as an important part of cultural inhibitors, especially in developing countries. After many years of distrust in the governmental systems, citizens would not trust the municipalities and their online portals. Thus, to increase the use of e-government in those parts of the world, first, there is a need to eliminate those cultural issues (Alshehri & Drew, 2010). The researcher Elbahnasawy (2014) has investigated inertia as an element that keeps some countries' corruption levels stable. In order to fight corruption, e-government adoption is a necessary step for the whole country.

The concept of inertia examined in this thesis refers to unconscious emotion connected to convenience. Changing channels may be stressful for the citizens. Even if they may know it is not the best way of doing things, they will still repeatedly use the current means of communication with the municipality (Rey-Moreno et al., 2018). In this way, inertia is hypnotized to limit the adoption of e-government by the citizens:

*H13: Inertia will negatively influence the willingness of non-users citizens to adopt e-government services.*
*H14: Inertia will negatively influence the willingness of users citizens to continue using e-government services.*

Resistance

One of the possible barriers to e-government adoption is the resistance from citizens who are scared to be completely replaced by technology and internet applications (Schwester, 2009). It is very closely connected to technology anxiety, namely the psychological readiness of the individual to adapt to change. In a paper proposed by Algharibi and Arvanitis (2011), technology anxiety is introduced as another moderator between the UTAUT constructs and behavioural intention to adapt to the technology.

In this paper, resistance tends to favor the current situation, even if faced with better alternatives (Rey-Moreno et al., 2018). Compared to inertia, an unconscious emotion, resistance is a deliberate choice of not changing the channel of communication with the municipality because of personal preferences or because of technology anxiety, or other reasons. Thus, the hypothesis is formulated as follows:

*H15: Resistance will negatively influence the willingness of non-users citizens to adopt e-government services.*

*H16: Resistance will negatively influence the willingness of users citizens to continue using e-government services.*

Habit

Considering habit as an action performed automatically over some time, different researchers demonstrated that it predicts the continuance of e-government services. Thus, once learned to use the online municipality services, the individual will continue to do so (Aranyossy, 2018; de Moraes & de Souza Meirelles, 2017; Veeramootoo, Nunkoo, & Dwivedi, 2018).

Rey-Moreno et al. (2018) were the first to consider habit as an inhibitor to e-government adoption. Thus, a person who learned to communicate with the municipality through more traditional channels (face to face or phone) will hardly switch to the digital means of communication. This assumption will be replicated in this paper with the following hypothesis:

*H17: Habit will negatively influence the willingness of non-users citizens to adopt e-government services.*

*H18: Habit will negatively influence the willingness of users citizens to continue using e-government services.*

### *2.4.3. Control variables and moderators*

Awareness

Despite the evident benefits that e-government services would bring to the citizens, such as time and effort saving, a great part of them still prefers the traditional way of communication with the municipality (Rey-Moreno et al., 2018). Perhaps it is due to the fact that not everyone knows about the benefits that e-government services can bring. The European Commission’s report shows that Belgium's digitalization level is in line with the European average. However, the penetration level, namely, the level of adoption of e-government, is underperforming. The report concludes by advising

to increase the awareness about the existing e-services in Belgian municipalities (European Commission, 2020b).

Previous research has already managed to verify the direct effect of the awareness on e-government usage (Ahmad et al., 2013; Carter & Weerakkody, 2008) or on the adoption of other types of technology, such as electronic banking (Pikkarainen, Pikkarainen, Karjaluoto, & Pahnila, 2004). However, awareness was not considered to influence e-services usage indirectly. Thus, in this paper, awareness will be considered in terms of "awareness of public services" proposed by Alawneh et al. (2013) and adopted to the e-government services. It will be analysed as a moderator between the performance expectancy construct of UTAUT and the use of e-government. The logic behind it is that with the greater knowledge about the digital services and their benefits, the citizen will expect the communication with the municipality and the performance of all the operations to be more efficient, which would lead to an increased willingness to adopt e-government by an individual.

*H19: Awareness will positively influence the relationship between performance expectancy and the willingness of non-users citizens to adopt e-government services.*

*H20: Awareness will positively influence the relationship between performance expectancy and users' willingness to continue using e-government services.*

Size of the city

The relationship between organizational size and the probability of adopting an innovation has been conducted in the marketing field (Kimberly, 1976; Rogers, 2002, 2010; Utterback, 1971). Some researchers found out that larger organizations adopt new technologies more easily than their smaller competitors. It depends on the resources available and the stakeholders who want to be sure about the business's long-run growth before investing in it.

This type of research lacks in the existing literature about e-government adoption in cities of different sizes. It was found that larger municipalities have more chances to attract active citizens and convince them to use e-services. They can manage to constantly improve e-government services and adapt them to the preferences of the local citizens. This is due to the fact that they have a greater advantage over the smaller administrative agencies in terms of financial and technical resources. (Moon, 2002; Moon & DeLeon, 2001).

Considering the existing literature, the size of the city and the fact that no article was written on the different intentions of usage of e-government between big and small cities, this research will focus on answering this question. As this research mostly examines four municipalities, two municipalities with a smaller number of inhabitants and total density: (1) Beringen (total population 46.882, total density 596,76 inh./km$^2$) and (2) Dipenbeek (total population 19.157, total density 462,57 inh./km$^2$); and two municipalities with larger population density: (1) Brussels (total population 179.277 and total density 5.500 inh./km$^2$) and Antwerpen (total population 523.248 and total density 2.600 inh./km$^2$). This research forms the hypotheses that the city size and, in this case, the total number of inhabitants in the municipality will influence the e-government usage. Thus two hypotheses were formulated:

*H21: Intention of usage of e-government will be greater in the municipalities with larger total population and total density.*

*H22: Continuance of usage of e-government will be greater in the municipalities with larger total population and total density.*

Technology anxiety

In the original work of Venkatesh et al. (2003) on the UTAUT model, computer anxiety was found not to influence the dependent variable behavioral intention directly. Later on, this dimension has been proposed by the researchers as an additional moderator between the constructs of the UTAUT model and the behavioural intention and use of the technologies (Algharibi & Arvanitis, 2011). However, no further research confirms the possibility of considering technology anxiety as an actual moderator of the UTAUT model.

This paper will examine such a possibility, placing technology anxiety as a possible variable having a negative moderating effect between the effort expectancy and the willingness to use e-government. Thus, it is hypothesized that with the increase of psychological anxiety for using the technology, the effort to use e-government would be perceived much greater, discouraging an individual from using the online services proposed by the municipality.

*H23: Technology anxiety will negatively influence the relationship between effort expectancy and the willingness of non-users citizens to adopt e-government services.*

*H24: Technology anxiety will negatively influence the relationship between effort expectancy and users' willingness to continue using e-government services.*

Age

As developers of the UTAUT model, Venkatesh et al. (2003) have examined age as a moderator between some of the model's constructs and behavioural intention. It was found that in the case of performance expectancy, it has a negative moderating effect, as with an increase of age, the effect of the performance expectancy will decrease.

A positive moderating effect was discovered for effort expectancy and social influence, as it is considered that with the older age, people give more importance to the opinions of others. This positive effect is also reflected in the facilitating conditions influencing the usage of the individuals.

Solvak et al. (2019) and Sharma (2015) have also observed that the adoption of e-governance increases with the decrease in age. Alomari et al. (2014) have also pointed out that different age groups have different usage habits. Considering these previous results, age will play an important role as a control variable in this research:

*H25: The willingness to adopt or continue to use e-government decreases with age.*

Gender

Venkatesh et al. (2003) have found that for women, effort expectancy and social influence have a stronger effect on the behavioral intention, but for men, performance expectancy has the strongest effect on the dependent variable behavioral intention. Many other researchers considered this variable in their works (Alomari et al., 2014; Aranyossy, 2018; Mensah & Mi, 2019; Sharma, 2015; Solvak et al., 2019; V. Venkatesh & Davis, 2000), proving different conclusions. In this research, it is hypothesized not to find any difference in the e-government usage between men and women:

*H26: There is no difference in the adoption and continuance of e-government usage between men and women.*

### *2.4.4. Overview of the hypotheses and conceptual model*

| Hypothesis n. | Description | Theoretical Basis |
|---|---|---|
| 1 | *Performance expectancy will positively influence the willingness of non-users citizens to adopt e-government services.* | (Rey-Moreno et al., 2018; Venkatesh et al., 2003) |
| 2 | *Performance expectancy will positively influence the willingness of users citizens to continue using e-government services.* | (Rey-Moreno et al., 2018; Venkatesh et al., 2003) |
| 3 | *Effort expectancy will positively influence the willingness of non-users citizens to adopt e-government services.* | (Rey-Moreno et al., 2018; Venkatesh et al., 2003) |
| 4 | *Effort expectancy will positively influence the willingness of users citizens to continue using e-government services* | (Rey-Moreno et al., 2018; Venkatesh et al., 2003) |
| 5 | *The social influence will positively influence the willingness of the non-users citizens to adopt e-government services.* | (Rey-Moreno et al., 2018; Venkatesh et al., 2003) |
| 6 | *The social influence will positively influence the willingness of users citizens to continue using e-government services.* | (Rey-Moreno et al., 2018; Venkatesh et al., 2003) |
| 7 | *Facilitating conditions will positively influence the willingness of non-users citizens to adopt e-government services* | (Rey-Moreno et al., 2018; Venkatesh et al., 2003) |
| 8 | *Facilitating conditions will positively influence the willingness of users citizens to continue using e-government services.* | (Rey-Moreno et al., 2018; Venkatesh et al., 2003) |
| 9 | *Perceived fear will positively influence the willingness of non-users citizens to adopt e-government services.* | (Raza et al., 2021) |
| 10 | *Perceived fear will positively influence the willingness of users citizens to continue using e-government services.* | (Raza et al., 2021) |
| 11 | *Perceived risk will negatively influence the willingness of non-users citizens to adopt e-government services* | (Akkaya et al., 2019; Graafland-Essers & Ettedgui, 2003; Schaupp & Carter, 2010) |

| | | |
|---|---|---|
| 12 | *Perceived risk will negatively influence the willingness of users citizens to continue using e-government services* | (Akkaya et al., 2019; Graafland-Essers & Ettedgui, 2003; Schaupp & Carter, 2010) |
| 13 | *Inertia will negatively influence the willingness of non-users citizens to adopt e-government services.* | (Rey-Moreno et al., 2018) |
| 14 | *Inertia will negatively influence the willingness of users citizens to continue using e-government services.* | (Rey-Moreno et al., 2018) |
| 15 | *Resistance will negatively influence the willingness of non-users citizens to adopt e-government services* | (Rey-Moreno et al., 2018; Schwester, 2009) |
| 16 | *Resistance will negatively influence the willingness of users citizens to continue using e-government services.* | (Rey-Moreno et al., 2018; Schwester, 2009) |
| 17 | *Habit will negatively influence the willingness of non-users citizens to adopt e-government services.* | (Rey-Moreno et al., 2018) |
| 18 | *Habit will negatively influence the willingness of users citizens to continue using e-government services.* | (Rey-Moreno et al., 2018) |
| 19 | *Awareness will positively influence the relationship between performance expectancy and the willingness of non-users citizens to adopt e-government services.* | (Ahmad et al., 2013; Alawneh et al., 2013; Carter & Weerakkody, 2008) |
| 20 | *Awareness will positively influence the relationship between performance expectancy and users' willingness to continue using e-government services.* | (Ahmad et al., 2013; Alawneh et al., 2013; Carter & Weerakkody, 2008) |
| 21 | *The intention of usage of e-government will be greater in the municipalities with a larger total population and total density.* | (Moon, 2002; Moon & DeLeon, 2001) |
| 22 | *Continuance of usage of e-government will be greater in the municipalities with a larger total population and total density.* | (Moon, 2002; Moon & DeLeon, 2001) |
| 23 | *Technology anxiety will negatively influence the relationship between effort expectancy and the willingness of non-users citizens to adopt e-government services* | (Algharibi & Arvanitis, 2011; Venkatesh et al., 2003) |
| 24 | *Technology anxiety will negatively influence the relationship between effort expectancy and users' willingness to continue using e-government services.* | (Algharibi & Arvanitis, 2011; Venkatesh et al., 2003) |
| 25 | *The willingness to adopt or continue to use e-government is greater for younger citizens* | (Sharma, 2015; Solvak et al., 2019; Venkatesh et al., 2003) |
| 26 | *There is no difference in the adoption and continuance of e-government usage between men and women.* | (Alomari et al., 2014; Aranyossy, 2018; Mensah & Mi, 2019; Sharma, 2015; Solvak et al., 2019; Venkatesh et al., 2003; V. Venkatesh & Davis, 2000) |

## 3. Methodology

### 3.1. Data collection and sampling

This paper used quantitative data collection, namely a survey powered by Qualtrics. The questionnaire consisted of 46 questions and it started with the information regarding the scope of the research. The definition of electronic administration was provided as well in this initial section. Participation in the study was voluntary and the participants' identities remained unknown for privacy reasons. However, at the end of the questionnaire, a non-mandatory question was inserted, asking to provide an e-mail. This question was introduced only for those who wanted to have a chance to win a reward, provided as a motivator for the greater response rate.

The survey was shared on different Facebook pages and 287 total answers were collected. The focus was directed to people who live in 1 of the four cities: Diepenbeek, Beringen, Antwerp or Brussels. However, in order to reach a representative sample of non-users of e-government, respondents from other cities could also fill in the survey.

The sampling technique chosen in this research is non-probability sampling and, more precisely, convenience sampling. It is a well-known technique used to collect data in a quick and efficient way (Sekaran & Bougie, 2016).

### 3.2. Data cleaning and reorganization

The raw data were transferred from Qualtrics to SPSS into two datasets in order to create two different models: users and non-users of e-government. As a first step before proceeding with the analysis, the missing values and outliers were deleted from both datasets. As a consequence, valid responses of 146 users and 26 non-users were included in the SPSS.

Because of the low number of responders who do not use e-government facilities and, consequently, the impossibility of rejecting or confirming the hypotheses, the analyses will not be performed on the non-users model. Thus, the following data related to the analysis will be performed only on the users' model.

As a next step, data was reorganised. The more comprehensible labels for the variables were inserted instead of the questions of the questionnaire; the values labels were organised in the following way: "helemaal mee oneens" = 1- "helemaal mee eens"=7; "Man"=1, "Vrouw"=2; "Beringen"=1, "Diepenbeek"=2, "Antwerpen"=3, "Brussels"=4; "Onder 18"=1 – "85 of ouder"=9.

As a last step of the data reorganisation, the negatively-keyed item "Awareness4" was reverse coded.

## 4. Data analysis

### 4.1. Demographics

For the purpose of this paper, some data about specific demographics were collected. Thus, the respondents were asked to indicate their city of residence, gender and age. Table 1 shows that, in general, the user respondents are almost equally distributed among the four cities. Moreover, users are almost perfectly divided between half men (45.9%) and half women (54.1%). Most user participants are between 25-34 years old: 31.5%. The least amount of users of e-government are people under 18 years old (0.7%).

Table 1

*Demographics*

| Variable | | Frequency | Percent |
|---|---|---|---|
| Cities | Beringen | 46 | 31.5 |
| | Diepenbeek | 32 | 21.9 |
| | Antwerp | 32 | 21.9 |
| | Brussels | 36 | 24.7 |
| Gender | Men | 67 | 45.9 |
| | Women | 79 | 54.1 |
| Age | Under 18 | 1 | 0.7 |
| | 18-24 | 37 | 25.3 |
| | 25-34 | 46 | 31.5 |
| | 35-44 | 28 | 19.2 |
| | 45-54 | 9 | 6.2 |
| | 55-64 | 19 | 13.0 |
| | 65-74 | 6 | 4.1 |

4.2. Descriptive statistics and normality of data

In order to get a feel for data and assess the normality of distribution, the descriptive statistics that included Skewness and Kurtosis tests were performed.

By looking at the minimum and the maximum values of the users' dataset (Table 2), we can see that, in the case of the variable "Habit", nobody strongly disagreed with the statements that using the current channel has become a habit. Indeed, the minimum value is 3, and the variable's mean value is *M=5.34*, which indicates the respondents' relatively high degree of agreement to the items of this construct. Other high values of the mean are in the case of "Performance expectancy" and "Effort expectancy" variables (*M=5.81* and *M=5.49* respectively), and the lowest mean value (*M=3.36*) belongs to the "Technology anxiety" variable.

As for the Standard Deviation, which is the square root of the Variance and the indication of the dispersion in the variable, in this case it is always close to 1. This would indicate that the values in the data set are quite close to the mean value. As the Std. Deviation is affected by outliers, it is a good sign of their absence or, at least, rather low quantity of outliers (Newbold, Carlson, & Thorne, 2007).

As the test of normality of distribution, the values of Skewness and Kurtosis were executed. Kurtosis points out the peakness of the data, while Skewness measures the symmetry of the distribution (Hinton, McMurray, & Brownlow, 2014). All the variables generally present a range between 0 and ±1, which is a good indication of the normality of distribution. However, in the construct "Continuance

to use", the value of Kurtosis exceeds 2, meaning that the distribution, in this case, is leptokurtic. This value of Kurtosis would compromise the assumption of normality of data (Hinton et al., 2014). However, some tests are still robust to the assumption of non-normality of data, such as regression analysis and test of ANOVA (Malhotra, Nunan, & Birks, 2017). In this paper, these two analyses will take place.

The construct "Continuance to use" also presents the Skewness value exciding -1, which indicates the left-skewed distribution. However, the value is not exceeding 2, so the assumption of normality cannot be rejected (Hinton et al., 2014).

Table 2

*Descriptive statistics*

| | Min | Max | Mean | Std. Deviation | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Continuance to use | 2 | 7 | 5.93 | 0.931 | -1.284 | 2.462 |
| Performance expectancy | 3 | 7 | 5.81 | 1.016 | -0.931 | 0.701 |
| Effort expectancy | 1 | 7 | 5.49 | 1.116 | -0.942 | 1.283 |
| Social influence | 1 | 7 | 4.74 | 1.097 | -0.326 | 0.285 |
| Facilitating conditions | 2 | 7 | 4.82 | 1.004 | -0.259 | -0.119 |
| Perceived fear | 1 | 7 | 3.89 | 1.596 | -0.200 | -0.868 |
| Inertia | 1 | 7 | 4.36 | 1.196 | -0.291 | 0.156 |
| Perceived risk | 1 | 7 | 3.43 | 1.532 | 0.349 | -0.435 |
| Resistance | 1 | 7 | 3.74 | 1.478 | 0.109 | -0.696 |
| Habit | 3 | 7 | 5.34 | 0.975 | -0.460 | -0.369 |
| Awareness | 1 | 7 | 4.30 | 1.365 | -0.384 | -0.465 |
| Technology anxiety | 1 | 6 | 3.36 | 1.420 | 0.070 | -0.885 |

### 4.3. Construct validity and reliability analysis

Reliability analysis

The method used in this paper to evaluate the scale reliability was the measure internal consistency, commonly called Cronbach's coefficient alpha. This test is widely used for assessing whether the items that belong to one construct are correlated with each other (Sekaran & Bougie, 2016). An acceptable value for Cronbach's alpha is considered a coefficient higher than $\alpha > 0.7$ (Peterson, 1994). However, some scholars argue that a value between $0.5 < \alpha < 0.7$ may still indicate moderate reliability of the scale (Hinton et al., 2014).

According to Table 3a, all items presented an acceptable coefficient, except for the items that measured "Effort expectancy", "Social influence" and "Facilitating conditions" constructs. These

constructs were adapted from the Rey-Moreno et al. (2018). The original constructs from Venkatesh et al. (2003) included more items, which could explain the relatively low value of Cronbach's alpha in this case. Peterson (1994) has also suggested that low coefficient alpha points out low inter-item correlation and indicates that the items may measure different constructs rather than one.
From Table 3b (in the appendix), it is comprehensible that the reliability of the construct "Facilitating conditions" drops by deleting any item, and the reliability of the "Social influence" construct does not increase considerably if the third item is deleted.
Thus the next step was to perform factor analysis to assess whether all the dimensions are appropriate for each construct. Factor analysis is a method used to investigate construct validity (Sekaran & Bougie, 2016).

Table 3a
*Cronbach's Alpha*

| | Cronbach's Alpha | N of items |
|---|---|---|
| Continuance to use | 0.712 | 2 |
| Performance expectancy | 0.763 | 2 |
| Effort expectancy | 0.679 | 2 |
| Social influence | 0.603 | 3 |
| Facilitating conditions | 0.607 | 3 |
| Perceived fear | 0.908 | 6 |
| Inertia | 0.712 | 3 |
| Perceived risk | 0.833 | 2 |
| Resistance | 0.862 | 3 |
| Habit | 0.764 | 3 |
| Awareness | 0.868 | 4 |
| Technology anxiety | 0.858 | 4 |

Factor analysis
One factor analysis for each multi-item construct was executed.
According to Table 4a, all the items could be retained in their respective constructs, as they all loaded rather heavily on component 1.
The correlation matrix was executed as well to identify if the items are poorly correlated with each other. In general, the strength of the relationship can be considered strong if the absolute value of the correlation coefficient is between $0.5<r< 1$; it is considered of medium strength if the coefficient is between $0.3<r<0.49$; and it is considered weak if the coefficient is between $0.1<r<0.29$ (Malhotra et al., 2017).

Table 4c presents the results from inter-item correlations for these three variables. All of the correlations are significant ($p<0.01$), and they present medium strength of relationship, except for "Social influence3" that resulted in being poorly correlated to "Social influence2" ($r=0.247$). Several elements were taken into consideration before deciding whether to keep this item in the construct or not. First of all, both items have a medium correlation with "Social influence1". Secondly, three items are still loaded on the same component (Table 4a). Thirdly, the communalities (Table 4b in the appendix), defined as the amount of variance in a variable is accounted for, are higher than the cut-off value (0.4) (Malhotra et al., 2017). Lastly, following the indications of Piedmont (2014), items are not representative of the same domain in the case when the inter-item correlation value is lower than $r<0.2$. In this case, 0.247>0.2 (Table 4c). Thus, the decision was made to keep all three items in the construct.

As a consequence, the possibility that "Effort expectancy", "Social influence", and "Facilitating conditions" constructs measure more than one construct was eliminated, and all the final selection of items is reported in the table below.

### 4.4. Hypotheses testing

In order to test the influence of facilitators ("Performance expectancy": H2; "Effort expectancy": H4; "Social influence": H6; "Facilitating Conditions": H8; and "Perceived fear": H10) and the inhibitors ("Perceived risk": H12; "Inertia": H14; "Resistance": H16; "Habit": H18), on the continuance to use e-government services, the first multiple regression analysis will be executed. Regression analysis is used to determine whether there is a relationship between the dependent and independent variable(s) and the strength of this relationship. Multiple regression analysis considers two or more independent variables and their relationship with one dependent variable (Malhotra et al., 2017).

Later, a second multiple regression analysis will be performed, and the moderator ("Awareness": H20) between "Performance expectancy" and "Continuance to use" will be taken into account. The third regression analysis will be performed to test the effect of the "Technology anxiety" on the relationship between effort expectancy and the willingness of citizens to continue using e-government (H24).

Next, to test the H22, namely the difference in e-government continuance of usage between the municipalities with a larger total population and total density (Antwerp and Brussels) and municipalities with a smaller total population and total density (Diepenbeek and Beringen), the t-test will be performed. The t-test will also be executed to test H26 and examine the difference in e-government usage continuance between men and women.

Next, the one-way ANOVA analysis will be executed to test the difference of usage continuance for different age groups (H25).

ANOVA or analysis of variance is an analysis used to examine whether there are significant differences between the means of two or more samples. One-way ANOVA involves only one dependent variable and one independent or factor (Malhotra et al., 2017).

Correlation matrix

Before proceeding with the regression analysis, a correlation matrix was executed to identify any high potential correlations between the independent variables. These high correlations would lead later on in the regression analysis to the multicollinearity problem (Hinton et al., 2014).

For this purpose, Pearson correlation was used. The value of the outcome of this analysis range between -1, which is a perfect negative correlation and +1 for a perfect positive correlation. The more the Pearson value is closer to zero, and less correlation there is between the variables. This assumption should take into consideration the p-value, which should be <0.01 or <0.05. In general, the strength of the relationship can be considered strong if the absolute value of the correlation coefficient is between *0.5 <r<1*; it is considered of medium strength if the coefficient is between *0.3 <r< 0.49*; and it is considered weak if the coefficient is between *0.1 <r< 0.29* (Malhotra et al., 2017).

By analysing Table 5, we can see several significant correlations between the variables, but most have rather weak or medium relationships. However, the two correlations seem to be stronger than the others. These are: the relationship between "Effort expectancy" and "Performance expectancy"(*r=0.557; p<0.01*), as well as the correlation between "Technology anxiety" and "Resistance" (*r=0.573; p<0.01*)

#### *4.4.1. Effect of Facilitators and Inhibitors on Continuance to use e-government*

Overall model performance

Before interpreting the coefficient of the regression analysis, the overall model performance is going to be analysed.

In this model, a significant regression equation was found $F(9,136)=13.706$, $p<0.05$, with the $R^2$ value of 0.476. It means that the independent variables present in this model explain 47.6% of the variation in the dependent variable "Continuance to use".

Interpretation of regression coefficients

After running the first regression analysis, the VIF values were always around 1, which indicates no multicollinearity between the variables.

"Performance expectancy" is one of the two variables that significantly influence the dependent variable. The second one is "Resistance" (Table 6a). In order to see the amount of change produced in the dependent variable by the change in one unit of the independent variable, we need to look at the Unstandardized B coefficient (Malhotra et al., 2017). In this case, one unit of change in "Performance expectancy"($\beta=0.4$, $p<0.01$) will translate to a 36.8% increase in the dependent variable. Thus, this variable has a significant positive impact on "Continuance to use".

Instead, one unit of change in "Resistance"($\beta=-.223$, $p<0.01$) would mean a decrease in the dependent variable by 14%. This independent variable has a significant negative impact on "Continuance to use". The complete table of this regression analysis is in the appendix.

Table 6a

*Interpretation of regression coefficients*

| | Unstandardized B coefficient | Beta | P-value |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Performance expectancy** | **0.368** | **0.401** | **0.000** |
| Effort expectancy | 0.108 | 0.130 | 0.113 |
| Social influence | -0.075 | -0.088 | 0.202 |
| Facilitating conditions | 0.085 | 0.092 | 0.181 |
| Perceived fear | 0.033 | 0.056 | 0.385 |
| Inertia | -0.011 | -0.015 | 0.845 |
| Perceived risk | 0.067 | 0.111 | 0.131 |
| **Resistance** | **-0.140** | **-0.223** | **0.007** |
| Habit | 0.127 | 0.134 | 0.076 |

*Note:* Dependent Variable: Continuance to use

#### *4.4.2. Effect of Awareness on the relationship between Performance expectancy and Continuance to use e-government*

In order to test the H20, namely the moderating effect of the variable "Awareness" between the interdependent variable "Performance expectancy" and the dependent one "Continuance to use", a new interaction term was created ("Performance expectancy X Awareness"). This main term and the interaction term were included in the model of the previous section, using hierarchical linear regression, and the second analysis was run.

Overall model performance

A hierarchical regression analysis was executed to see the effects of the main term by itself and then add the interaction term in the next step. Thus, two models are organised as follows: model 1 is the model of the previous section (facilitators and inhibitors) with the addition of the variable "Awareness" as the main term; model 2 also adds the interaction term "Performance expectancy X Awareness".

Model 1: By adding the main term to the model, no significant change was found compared to the previous model with only facilitators and inhibitors. Thus $\Delta F(1,135)=.202$, $p=.654$, $\Delta R^2 =.001$, meaning that adding "Awareness" to the model did not contribute additional variance in the dependant variable. On the contrary, the adjusted R Square diminished (from .441 in the previous section to .438), indicating that perhaps "Awareness" is a redundant variable in this model.

Model 2: the interaction term is added to this model, and it shows no significant change compared to model 1 in this section. Thus $\Delta F(1,134)=.202$, $p=.892$, $\Delta R^2 =.000$, meaning that the interaction term "Performance expectancy X Awareness" also does not contribute additional variance in the dependent variable. Like in the previous model, the adjusted R Square diminished slightly, which could signify another redundant variable added.

Interpretation of regression coefficients

The interaction term in the second model presented a source of a multicollinearity problem. Indeed, the VIF values of "Awareness" and the value of the new interaction term exceeded 10. It may present a problem for further interpretation, making the regression coefficients unreliable (Sekaran & Bougie, 2016).

The solution to this problem was found in the research of van Riel, Lemmink, and Ouwersloot (2001) through a "residual centring method". After computing the new interaction term with centred variables, a new regression analysis was executed. The results this time showed a rather low level of VIF values (complete table in the appendix).

Hereunder is the overview of the Unstandardized B coefficients and their corresponding p-values of the second model, including the main term "Awareness" and the interaction term "Performance expectancy X Awareness". Both variables have no significant effect on the dependent variable "Continuance to use". The two variables from the previous section ("Performance expectancy" and "Resistance") still have a significant influence on the dependent variable.

Table 7a

*Interpretation of regression coefficients*

| | Unstandardized B coefficient | Beta | P-value |
|---|---|---|---|
| **Performance expectancy** | **.364** | **.397** | **.000** |
| Effort expectancy | .111 | .134 | .111 |
| Social influence | -.076 | -.090 | .201 |
| Facilitating conditions | .091 | .098 | .165 |
| Perceived fear | .032 | .055 | .400 |
| Inertia | -.010 | -.012 | .871 |
| Perceived risk | .066 | .108 | .156 |
| **Resistance** | **-.140** | **-.222** | **.008** |
| Habit | .133 | .140 | 0.70 |
| Awareness | -.020 | -.030 | .661 |
| Performance expectancy X Awareness | -.006 | -.009 | .892 |

*Note:* Dependent Variable: Continuance to use

#### *4.4.3. Effect of Technology anxiety on the relationship between Effort expectancy and Continuance to use e-government*

In order to test the H14, namely the moderating effect of the variable "Technology anxiety" between the interdependent variable "Effort expectancy" and the dependent one "Continuance to use", a new interaction term was created ("Technology anxiety X Effort expectancy"). This main term and the interaction term were included in the model analysing facilitators and inhibitors. A hierarchical regression analysis was executed.

Overall model performance

The hierarchical regression analysis is organised in this way: model 1 is the main one (which includes only facilitators and inhibitors) with the addition of the variable "Technology anxiety"; model 2 also included the interaction term "Technology anxiety X Effort expectancy".

Model 1: Presents no significant change compared to the model with only facilitators and inhibitors. $\Delta F(1,135)=2.783$, $p=.098$, $\Delta R^2 =.011$, meaning that adding "Technology anxiety" to the model contributes 1% additional variance in the dependant variable, but it is still not a significant addition to the model.

Model 2: in this case, adding of the interaction term also did not produce any significant change in the model: $\Delta F(1,134)=1.611$, $p=.207$, $\Delta R^2 =.006$

Interpretation of regression coefficients

As in the previous section, the interaction term in the second model presented a source of a multicollinearity problem. Indeed, the VIF values of "Technology anxiety" and the value of the new interaction term exceeded 10. Again, this problem was solved the same way as in the previous section, using a "residual centring method".

Hereunder is the overview of the Unstandardized B coefficients and their corresponding p-values of the second model, including "Technology anxiety" and the interaction term "Technology anxiety X Effort expectancy". Both variables have no significant effect on the dependent variable "Continuance to use". The two variables ("Performance expectancy" and "Resistance") still have a significant influence on the dependent variable.

Table 8a

*Interpretation of regression coefficients*

| | Unstandardized B coefficient | Beta | P-value |
|---|---|---|---|
| **Performance expectancy** | **0.347** | **.378** | **0.000** |
| Effort expectancy | 0.094 | .112 | 0.169 |
| Social influence | -0.073 | -.086 | 0.211 |
| Facilitating conditions | 0.098 | .106 | 0.123 |
| Perceived fear | 0.039 | .066 | 0.316 |
| Inertia | 0.010 | .013 | 0.872 |
| Perceived risk | 0.080 | .131 | 0.082 |
| **Resistance** | **-0.119** | **-.188** | **0.027** |
| Habit | 0.135 | .141 | 0.062 |
| Technology anxiety | -0.092 | -.140 | 0.103 |
| Technology anxiety X Effort expectancy | 0.046 | .082 | 0.207 |

*Note:* Dependent Variable: Continuance to use

#### *4.4.4. Effect of the city size and gender on usage continuance e-government*

City size: Levene's test indicated equal variances (*F=0.52, p=.819*), and the t-test was found to be statistically non-significant t(144)=-.967, p=.335. Thus, it is possible to conclude that there is no significant difference in the usage continuance of e-government services between a sample of 78 people who live in small cities (*M=5.87, SD=.979*) and a sample of 68 people who live in large cities (*M=6.01, SD=.872*).

Gender: as in in the case of cities, Levene's test assumed equal variances (F=.502, p=.480), and the t-test has no statistical significance t(144)=-.64, p=.949. Again, it can be concluded that there is no significant difference in continuance of usage between a sample of 67 men (*M=5.94, SD=.864*) and a sample of 79 women (*M=5.93, SD=.989*).

Table 9

*T-test for gender and city size*

| Dependent measure | Gender | | | | City size | | | |
|---|---|---|---|---|---|---|---|---|
| | *M(SD)* | | *t*-value | *p*-value | *M(SD)* | | *t*-value | *p*-value |
| | Male | Female | | | Large | Small | | |
| *Continuance to use* | 5.94(.864) | 5.93(.989) | -.064 | .949 | 6.01(.872) | 5.87(.979) | -.967 | .335 |

*Note*: M=Mean, SD=Standard Deviation

#### *4.4.5. Effect of age on usage continuance e-government*

After performing the analysis, the test of homogeneity of variances (Levene's test) assumed equal variances (F=.502, p=.480), and the ANOVA test was found to be statistically not significant F(6,139)=1.190 p=.315. Consequently, the conclusion can be made that there is no significant difference between any user age group.

Table 10

One-way ANOVA test for Age groups

| Dependent measure | df (between groups) | df (within groups) | F-value | P-value |
|---|---|---|---|---|
| Continuance to use | 6 | 139 | 1.190 | .315 |

## 5. Results and Discussion

### 5.1. A general summary of the results

The purpose of this research paper was to investigate to what extent the proposed facilitators and inhibitors influence the willingness of citizens to adopt or to continue using e-government. Moreover, another objective was to examine the difference in usage of e-government services between municipalities with small total population/total density and large total population/total density.

As mentioned in the methodology part, the low number of non-responders (N=26) made it impossible to perform any analyses and test the hypotheses. Consequentially, all the results and Discussion parts will be referring only to the users model (N=146).

The following table presents the results of different analyses performed on the dataset in order to test the hypotheses. After executing the first general multiple regression analysis for facilitators and inhibitors, it was found that only two independent variables, namely "Performance expectancy" ($\beta$=0.4, $p<0.01$) – H2 and "Resistance" ($\beta$=-.223, $p<0.01$) - H16 have a significant influence on the continuance of usage of the citizens. The rest of the hypotheses, namely H4 ("Effort expectancy" ($\beta$=0.130, p=.113)); H6 ("Social influence" ($\beta$=-.088, p=.202)); H8 ("Facilitating conditions" ($\beta$=.092, p=.181)); H10 ("Perceived fear" ($\beta$=.056, p=.385)); H12 ("Perceived risk" ($\beta$=.111, p=.131)); H14 ("Inertia" ($\beta$=-.015, p=.845)) and H18 ("Habit" ($\beta$=.134, p=.076)) were rejected.

The following two hierarchical regression analyses produced no significant change compared to the main model, and thus hypotheses H20 ( with awareness as moderator ($\beta$=-.009, p=.892)) and H24 (with Technology anxiety as moderator ($\beta$=.082, p=.207)) were rejected.

Moreover, after performing the t-test, it was found that there is no statistical difference in the intention to continue using e-government between men and women ($t(144)=-.64$, p=.949). It supports another hypothesis, namely H26, for the users' part. However, the H22 was rejected after the t-test for city size was found to be statistically non-significant $t(144)=-.967$, p=.335.

Lastly, according to the results of the ANOVA test performed on the different age groups, the H25 was rejected as well ($F(6,139)=1.190$ p=.315).

Table 11

*Hypotheses outcomes*

| Hypothesis n. | Description | |
|---|---|---|
| 1 | *Performance expectancy will positively influence the willingness of non-users citizens to adopt e-government services.* | Not tested |
| 2 | *Performance expectancy will positively influence the willingness of users citizens to continue using e-government services.* | Supported |
| 3 | *Effort expectancy will positively influence the willingness of non-users citizens to adopt e-government services.* | Not tested |
| 4 | *Effort expectancy will positively influence the willingness of users citizens to continue using e-government services* | Not Supported |

| | | |
|---|---|---|
| 5 | *The social influence will positively influence the willingness of the non-users citizens to adopt e-government services.* | Not tested |
| 6 | *The social influence will positively influence the willingness of users citizens to continue using e-government services.* | Not Supported |
| 7 | *Facilitating conditions will positively influence the willingness of non-users citizens to adopt e-government services* | Not tested |
| 8 | *Facilitating conditions will positively influence the willingness of users citizens to continue using e-government services.* | Not Supported |
| 9 | *Perceived fear will positively influence the willingness of non-users citizens to adopt e-government services.* | Not tested |
| 10 | *Perceived fear will positively influence the willingness of users citizens to continue using e-government services.* | Not supported |
| 11 | *Perceived risk will negatively influence the willingness of non-users citizens to adopt e-government services* | Not tested |
| 12 | *Perceived risk will negatively influence the willingness of users citizens to continue using e-government services* | Not Supported |
| 13 | *Inertia will negatively influence the willingness of non-users citizens to adopt e-government services.* | Not tested |
| 14 | *Inertia will negatively influence the willingness of users citizens to continue using e-government services.* | Not Supported |
| 15 | *Resistance will negatively influence the willingness of non-users citizens to adopt e-government services* | Not tested |
| 16 | *Resistance will negatively influence the willingness of users citizens to continue using e-government services.* | Supported |
| 17 | *Habit will negatively influence the willingness of non-users citizens to adopt e-government services.* | Not tested |
| 18 | *Habit will negatively influence the willingness of users citizens to continue using e-government services.* | Not Supported |
| 19 | *Awareness will positively influence the relationship between performance expectancy and the willingness of non-users citizens to adopt e-government services.* | Not tested |
| 20 | *Awareness will positively influence the relationship between performance expectancy and users' willingness to continue using e-government services.* | Not supported |
| 21 | *The intention of usage of e-government will be greater in the municipalities with a larger total population and total density.* | Not tested |

| | | |
|---|---|---|
| 22 | *Continuance of usage of e-government will be greater in the municipalities with a larger total population and total density.* | Not Supported |
| 23 | *Technology anxiety will negatively influence the relationship between effort expectancy and the willingness of non-users citizens to adopt e-government services* | Not tested |
| 24 | *Technology anxiety will negatively influence the relationship between effort expectancy and users' willingness to continue using e-government services.* | Not Supported |
| 25 | *The willingness to adopt or continue to use e-government is greater for younger citizens* | Not supported |
| 26 | *There is no difference in the adoption and continuance of e-government usage between men and women.* | Supported |

### 5.2. Facilitators, inhibitors and their influence on the continuance to use e-government

Facilitators

This paper has analysed five different facilitators: 4 UTAUT variables (Performance expectancy, Effort Expectancy, Social influences and Facilitating conditions) adapted from Venkatesh et al. (2003) and Perceived fear, a relatively new concept, connected to the recent outbreak of Covid-19 pandemic. It was defined as the fear of being affected by the disease and being scared for personal health and loved ones (Raza et al., 2021).

In this thesis, it was found that only one UTAUT construct out of 4 positively influences the willingness of citizens to use e-government, the Performance expectancy construct. More specifically, the citizens who already use e-government believe that the system is useful in their lives and increases the quality of the services from the municipality. It is consistent with the previous studies from Venkatesh et al. (2003) and Rey-Moreno et al. (2018).

However, despite the outcomes of the results from the same authors, users' willingness to use e-government services was not significantly influenced by effort expectancy. Even though the variable's mean value (M=5.49) was relatively high (on a scale from 1 to 7), it was not one of the predictors for the continuance of e-government usage. Probably it is because some of the services a citizen needs to perform are too complicated to execute over the Internet due to increased bureaucracy or too complicated procedures to follow. Alternatively, some of the platforms that the four cities use to communicate with the citizens are not user-friendly enough.

Moreover, citizens did not perceive the social influence as a great motivator for the continuance to use e-government. The social influence involves friends, family, as well as the public administration itself. Probably, it may be explained from the cultural point of view. According to Hofstede (2011), every culture can be analysed according to four dimensions. One of the dimensions is "individualism", when people prefer to listen to her/his own opinion and autonomy is favoured. Indeed, Belgium has a high degree of individualism, and it would explain why Belgian citizens do not find important the opinions of others or do not "push" somebody to perform some action.

As a last observation, respondents did not believe that it is easy to access the electronic from any device. In the case of effort expectancy, the explanation can be in the platforms that are not user-

friendly and do not give the possibility to perform all the services from the phone. It also decreases the possibility for the citizens to use the e-government whenever they want.

To conclude on the UTAUT constructs, the Belgian citizens generally believe that electronic administration is useful and it has many advantages to use, but perhaps the system itself needs to be improved in order to provide better services and increase the willingness of citizens to continue using it.

As for the additional facilitator analysed in this paper, namely Perceived fear, it produced no significant influence on the willingness of citizens to continue using e-government services. The variable's mean value (M=3.89) tends to be neutral (on a scale from 1 to 7), indicating that probably, generally speaking, citizens are not concerned about the negative effects of the pandemic. Thus, it does not affect their intention to increase the use of e-government technologies.

Inhibitors

In this research, a total of four variables were adapted as inhibitors: Inertia, Resistance and Habit, three constructs already analysed in previous research from Rey-Moreno et al. (2018) and Perceived risk, defined as the belief (or fear) that the person may incur in a loss during the pursuit of any action on a specific platform (Schaupp & Carter, 2010).

Only one of the inhibitors was found as a predictor of users' unwillingness to continue using e-government, Resistance. It is consistent with the findings of Rey-Moreno et al. (2018). Indeed, the citizens who already use e-government agreed on not liking that the public administration is changing their way of making decisions related to the use of public services. The possible explanation is that people probably have to use e-government because they have no time or cannot reach the municipality offline for other reasons. They would probably prefer the public administration to make it easier to perform the procedures offline instead of transferring everything online. However, different constraints force them to continue using the e-government, probably against their will.

In the case of Inertia, despite the results produced by Rey-Moreno et al. (2018), in this research, respondents did not hold to a unique channel of communication just because unconscious emotions guided them. It could mean that Belgian citizens perform actions with prior consideration, and if there is a possibility to do things in a better way, they will do it. It involves changing the communication channel and going more digital, for example, if it gives more advantages in performing municipality operations. On the contrary, it could mean going to the municipality and perform the operations offline if it provides benefits.

The Habit, like Inertia, does not affect the willingness of the citizens to use e-government. This outcome is also not consistent with the research outcome from Rey-Moreno et al. (2018). The citizens would probably use the channel that is more comfortable for them at that moment, without relying automatically on the channel they are used to.

Lastly, the Perceived risk also had no significant influence on the intention of citizens to continue using e-government services. The results are inconsistent with the previous studies (Akkaya et al., 2019; Graafland-Essers & Ettedgui, 2003; Schaupp & Carter, 2010). Perceived risk concerns the citizens' fear of providing their personal information to e-government because of security reasons. Thus, citizens are probably not afraid to insert their personal information into the system, meaning they perceive the e-government as a secure and safe network.

### 5.3. Effect of Awareness on the relationship between Performance expectancy and Continuance to use e-government

Awareness is the construct that aims to assess how much citizens are familiar with the e-government services and their benefits (Alawneh et al., 2013). The idea behind placing awareness between performance expectancy and willingness of citizens to adopt e-government is the following: if citizens received enough information about how to use e-government and its benefits, it would help them understand how it is helpful and useful in their lives. Hence, it would increase their e-government usage. However, the variables had neither significant direct effect nor through interaction term on the usage of e-government. The variable's mean value is also not that high (M=4.30), indicating that people generally do not receive enough information from the public administration. Thus, despite the obvious benefits of e-government mentioned in the previous studies, such as financial (Ahmad et al., 2013), time-saving (Heeks, 2006), also in terms of convenience (Alawneh et al., 2013), and simplification of the procedures (Pappa & Stergioulas, 2006), most of the citizens might be not aware of them.

### 5.4. Effect of Technology anxiety on the relationship between Effort expectancy and Continuance to use

Venkatesh et al. (2003) has defined Technology anxiety as a fear of any technological system. This could be connected to losing information because of some system error or personal fault (for example, by hitting the wrong button). Algharibi and Arvanitis (2011) proposed it as an additional moderator between the constructs of the UTAUT model and the usage of e-government. Indeed, this paper accessed it as the moderator between effort expectancy and the willingness of citizens to continue using e-government. It was hypothesized that with the increase of psychological anxiety for using the technology, the effort to use e-government would be perceived much greater, discouraging an individual from using the online services proposed by the municipality.

However, it had no significant influence, neither as a main term nor an interaction term. Considering that the questionnaire was administrated through social media, thus to people who already use computers and the Internet, it may have influenced the research outcome. This will be included as a limitation to the study.

### 5.5. Effect of the city size and gender on usage continuance e-government

Gender represents a confirmed moderator for the UTAUT model (Venkatesh et al., 2003). This paper's objective was to identify the possible differences in e-government usage between men and women. The difference in willingness to continue using e-government was found to be not significant. The result is consistent with the previous studies (Alomari et al., 2014; Aranyossy, 2018).

As for the city size, four different cities (and municipalities) were inserted in this model: Beringen, Diepenbeek, Brussels and Antwerpen. The idea behind the hypothesis was that the willingness to use e-government is greater in bigger cities because they can most probably improve their services and have an advantage over the smaller cities with less technical and financial resources (Moon, 2002; Moon & DeLeon, 2001). However, the results have shown that there is no significant difference between these cities in the willingness of the citizens to continue using e-government. It probably

can be explained by the fact that the public administrations in the larger cities do not engage enough with their citizens to increase the general intention of usage of e-government.

### 5.6. Effect of age on usage continuance of e-government services

Many studies (for instance, Venkatesh et al. (2003), Solvak et al. (2019) and Sharma (2015)) would point out the fact that usage increases with the decrease in age. However, in this paper, the difference between different age groups was non-significant to confirm the hypothesis. As with the Technology anxiety variable, it may be because the questionnaire was answered by people who are already present online and use the Internet every day for different operations. As a fact, it was impossible to get to non-users of e-government in this research.

## 6. Recommendation for future research and limitations

The greatest limitation of this research is the lack of a representative sample of the non-users model (n=26). The low rate of non-users could be explained by the collection data method through social media pages and word of mouth. People who already use the internet for social media are more likely to use e-government and its services. The online collection data method was chosen because of the impossibility of performing offline data collection due to Covid-19. This limitation would invalidate the results of this research. Another obstacle of the research is the impossibility of comparing the two models due to the great difference in the sample size between them. Moreover, this research paper focused on the local level, considering some municipalities of the Belgian provinces. Thus, the results should not be generalized to represent the country.

The analysis presented some limitations as well. First of all, some of the constructs presented slightly low reliability between their items, such as Effort expectancy ($\alpha$=0.679), Social influence ($\alpha$=0.603) and Facilitating conditions ($\alpha$=0.607). Second, the distribution of data in the variable "Continuance to use" showed to be leptokurtic when performed the Kurtosis test.

One of the suggestions for future research would be to include the cultural dimensions, for example, of Hofstede (2011) and to evaluate whether, for instance, a high level of cultural individualism/power distance/masculinity/uncertainty avoidance could influence the willingness of citizens to use e-government.

Another interesting point of view for future research is analyzing the same model but considering the opinions of people working for public administration.

If the pandemic situation would allow, another research could investigate other cities of Belgium, maybe the cities in Wallonia, as it is well known that citizens from Flanders and Wallonia are quite different. Perhaps they are also different in the usage of e-government. To a greater extent, the comparison can be made between Belgium and another European country. It would be a good opportunity to see the improvements the Belgian e-government still needs to perform on its digital services.

## 7. Conclusion and Managerial implications

To conclude, the objective of this research was to answer the question: "To what extent do the proposed facilitators and inhibitors influence the willingness of citizens to adopt or to continue using e-government?". Moreover, another objective was to examine the difference in usage of e-government services between municipalities with small total population/total density and large total population/total density.

It was found that even if user citizens agree that e-government is useful and helpful, it is not always easy to perform all the procedures from different devices. Consequently, it can be complicated to communicate with public administration when it is comfortable for citizens. Public administration could improve e-government platforms: by making them easier to access and more comprehensible, it would probably increase the rate of e-government usage.

Lastly, advice for the Belgian public administration, in line with the European Commission (2020b), is to increase the general awareness of the services of e-government and its benefits, as many citizens may still not be familiar with all the advantages of digital communication with municipalities.

## 8. Bibliography


Accenture. (2004). *eGovernment leadership: High performance, maximum value*: Accenture.

Ahmad, M. O., Markkula, J., & Oivo, M. (2013). Factors affecting e-government adoption in Pakistan: a citizen's perspective. *Transforming Government: People, Process and Policy*.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211.

Akkaya, C., Jakob, M., & Krcmar, H. (2019). *Potential Use of Citizen Accounts on e-Government Portals.* Paper presented at the ECDG 2019 19th European Conference on Digital Government.

Al-Maroof, R. S., Salloum, S. A., Hassanien, A. E., & Shaalan, K. (2020). Fear from COVID-19 and technology adoption: the impact of Google Meet during Coronavirus pandemic. *Interactive Learning Environments*, 1-16.

Al-Shafi, S., & Weerakkody, V. (2010). Factors affecting e-government adoption in the state of Qatar.

Al-Mamari, Q., Corbitt, B., & Gekara, V. O. (2013). E-government adoption in Oman: motivating factors from a government perspective. *Transforming Government: People, Process and Policy*.

Alawneh, A., Al-Refai, H., & Batiha, K. (2013). Measuring user satisfaction from e-Government services: Lessons from Jordan. *Government Information Quarterly, 30*(3), 277-288.

Algharibi, A. J., & Arvanitis, T. N. (2011). *Adapting the Unified Theory of Acceptance and Use of Technology (UTAUT) as a tool for validating user needs on the implementation of e-Trial software systems.* Paper presented at the Proceedings of HCI 2011 The 25th BCS Conference on Human Computer Interaction 25.

Alomari, M. K., Sandhu, K., & Woods, P. (2014). Exploring citizen perceptions of barriers to e-government adoption in a developing country. *Transforming Government: People, Process and Policy*.

Alshehri, M., & Drew, S. (2010). Challenges of e-government services adoption in Saudi Arabia from an e-ready citizen perspective. *World Academy of Science, Engineering and Technology, 66*, 1053-1059.

Alzahrani, L., Al-Karaghouli, W., & Weerakkody, V. (2017). Analysing the critical factors influencing trust in e-government adoption from citizens' perspective: A systematic review and a conceptual framework. *International business review, 26*(1), 164-175.

Aranyossy, M. (2018). *Citizen adoption of e-government services-Evidence from Hungary.* Paper presented at the Bled eConference.

Baum, C., & Di Maio, A. (2000). Gartner's four phases of e-government model. *Gartner Group, 12*.

Bélanger, F., & Carter, L. (2008). Trust and risk in e-government adoption. *The Journal of Strategic Information Systems, 17*(2), 165-176.

Carter, L., & Weerakkody, V. (2008). E-government adoption: A cultural comparison. *Information systems frontiers, 10*(4), 473-482.

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS quarterly*, 189-211.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace 1. *Journal of applied social psychology, 22*(14), 1111-1132.

Dawes, S. S. (2002). The future of e-government. *Center for technology in government*, 2006-1781.

de Moraes, G. H. S. M., & de Souza Meirelles, F. (2017). User's perspective of Eletronic Government adoption in Brazil. *Journal of technology management & innovation, 12*(2), 1-9.

Elbahnasawy, N. G. (2014). E-government, internet adoption, and corruption: an empirical investigation. *World Development, 57*, 114-126.

European Commission. (2020a). *eGovernment Benchmark 2020. eGovernment that works for the people. Background report*. Retrieved from https://ec.europa.eu/digital-single-market/en/news/egovernment-benchmark-2020-egovernment-works-people:

European Commission. (2020b). *eGovernment Benchmark 2020. eGovernment that works for the people. Country Factsheets*. Retrieved from https://ec.europa.eu/digital-single-market/en/news/egovernment-benchmark-2020-egovernment-works-people:

Eurostat Information Society Indicators. (2020). *Individuals using the internet for interacting with public authorities*. Retrieved from http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do:

Fahy, J., & Jobber, D. (2015). Foundations of marketing.

Fan, J., Zhang, P., & Yen, D. C. (2014). G2G information sharing among government agencies. *Information & Management, 51*(1), 120-128.

Government of the Republic of Croatia. (2020). *Croatia launches its first COVID-19 digital assistant*. Retrieved from https://vlada.gov.hr/glavni-izbornik-14951/news/croatia-launches-its-first-covid-19-digital-assistant/29234:

Graafland-Essers, I., & Ettedgui, E. (2003). *Benchmarking e-Government in Europe and the US*: Rand Corporation.

Heeks, R. (2006). *Understanding and measuring eGovernment: international benchmarking studies.* Paper presented at the UNDESA workshop,"E-Participation and E-Government: Understanding the Present and Creating the Future", Budapest, Hungary.

Hinton, P., McMurray, I., & Brownlow, C. (2014). *SPSS explained*: Routledge.

Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online readings in psychology and culture, 2*(1), 2307-0919.1014.

Horrigan, J. B. (2005). On Demand Citizens: e-government at high speed. *Pew Internet & American Life Project*.

Hu, G., Pan, W., Lu, M., & Wang, J. (2009). The widely shared definition of e-Government. *The Electronic Library*.

Jayashree, S., & Marthandan, G. (2010). Government to E-government to E-society. *Journal of Applied Sciences(Faisalabad), 10*(19), 2205-2210.

Kim, S., & Lee, J. (2012). E-Participation, Transparency, and Trust in Local Government. *Public administration review, 72*(6), 819-828. doi:10.1111/j.1540-6210.2012.02593.x

Kimberly, J. R. (1976). Organizational size and the structuralist perspective: A review, critique, and proposal. *Administrative science quarterly*, 571-597.

Kumar, V., Mukerji, B., Butt, I., & Persaud, A. (2007). Factors for successful e-government adoption: A conceptual framework. *Electronic Journal of E-government, 5*(1).

Layne, K., & Lee, J. (2001). Developing fully functional E-government: A four stage model. *Government Information Quarterly, 18*(2), 122-136.

Lin, Y. (2019). *Government Management Model of Non-profit Organizations Based on E-government.* Paper presented at the Proceedings of the 2019 7th International Conference on Computer and Communications Management.

Malhotra, N. K., Nunan, D., & Birks, D. F. (2017). *Marketing research: An applied approach*: Pearson Education Limited.

Mensah, I. K., & Mi, J. (2019). Predictors of the Readiness to Use E-Government Services From Citizens' Perspective. *International Journal of Technology Diffusion (IJTD), 10*(1), 39-59.

Moon, M. J. (2002). The evolution of e-government among municipalities: rhetoric or reality? *Public administration review, 62*(4), 424-433.

Moon, M. J., & DeLeon, P. (2001). Municipal reinvention: Managerial values and diffusion among municipalities. *Journal of Public Administration Research and Theory, 11*(3), 327-352.

Naranjo-Zolotov, M., Oliveira, T., & Casteleyn, S. (2019). Citizens' intention to use and recommend e-participation. *Information Technology & People*.

National Research University Higher School of Economics. (2020). *Digital transformation of megapolises: from zero to #1 in UN digital e-government ranking*. Retrieved from https://www.coursera.org/learn/digital-transformation-of-megapolises:

Newbold, P., Carlson, W. L., & Thorne, B. (2007). *Statistics for business and economics* (Vol. 984): Pearson Prentice Hall Upper Saddle River, NJ.

Pappa, D., & Stergioulas, L. (2006). *G2C AND C2G: Emerging Principles and Architectures in E-government and E-participation'*.

Pavlou, P. A., Tan, Y.-H., & Gefen, D. (2003). *Institutional trust and familiarity in online interorganizational relationships.* Paper presented at the Proceedings of the European Conference on Information Systems (ICIS) Naples, Italy.

Peterson, R. A. (1994). A meta-analysis of Cronbach's coefficient alpha. *Journal of Consumer Research, 21*(2), 381-391.

Phang, C., & Kankanhalli, A. (2008). A framework of ICT exploitation for e-participation initiatives. *51*(12), 128-132. doi:10.1145/1409360.1409385

Piedmont, R. L. (2014). Inter-item Correlations. In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 3303-3304). Dordrecht: Springer Netherlands.

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet research*.

Raza, S. A., Qazi, W., Khan, K. A., & Salam, J. (2021). Social Isolation and Acceptance of the Learning Management System (LMS) in the time of COVID-19 Pandemic: An Expansion of the UTAUT Model. *Journal of Educational Computing Research, 59*(2), 183-208.

Rey-Moreno, M., Felício, J. A., Medina-Molina, C., & Rufín, R. (2018). Facilitator and inhibitor factors: Adopting e-government in a dual model. *Journal of business research, 88*, 542-549. doi:10.1016/j.jbusres.2017.11.015

Rico-Pinto, J. S., & Sánchez-Torres, J. M. (2019). *Characterization of G2G Interoperability Factors.* Paper presented at the ECDG 2019 19th European Conference on Digital Government.

Rogers, E. M. (2002). Diffusion of preventive innovations. *Addictive behaviors, 27*(6), 989-993.

Rogers, E. M. (2010). *Diffusion of innovations*: Simon and Schuster.

Rowley, J. (2011). e-Government stakeholders—Who are they and what do they want? *International journal of Information management, 31*(1), 53-62.

Royal Oman Police. (2020). *COVID-19*. Retrieved from www.rop.gov.om:

Sawalha, S., Al-Jamal, M., & Abu-Shanab, E. (2019). The influence of utilising Facebook on e-government adoption. *Electronic Government, an International Journal, 15*(1), 1-20.

Schaupp, L. C., & Carter, L. (2010). The impact of trust, risk and optimism bias on E-file adoption. *Information systems frontiers, 12*(3), 299-309.

Schwester, R. (2009). Examining the barriers to e-government adoption. *Electronic Journal of E-government, 7*(1).

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*: John Wiley & Sons.

Sharma, S. K. (2015). Adoption of e-government services. *Transforming Government: People, Process and Policy*.

Sintomer, Y., Herzberg, C., Allegretti, G., Röcke, A., & Alves, M. L. (2013). Participatory budgeting worldwide. *Dialog Global*(25), 1-93.

Soliman, K. S., Affisco, J. F., Belanger, F., & Hiller, J. S. (2006). A framework for e-government: privacy implications. *Business process management journal*.

Solvak, M., Unt, T., Rozgonjuk, D., Võrk, A., Veskimäe, M., & Vassil, K. (2019). E-governance diffusion: Population level e-service adoption rates and usage patterns. *Telematics and informatics, 36*, 39-54. doi:10.1016/j.tele.2018.11.005

Taylor, S., & Todd, P. (1995). Assessing IT usage: The role of prior experience. *MIS quarterly*, 561-570.

Teerling, M. L., & Pieterson, W. (2010). Multichannel marketing: An experiment on guiding citizens to the electronic channels. *Government Information Quarterly, 27*(1), 98-107. doi:10.1016/j.giq.2009.08.003

Thompson, R. L., Higgins, C. A., & Howell, J. M. (1991). Personal computing: toward a conceptual model of utilization. *MIS quarterly*, 125-143.

Twizeyimana, J. D., & Andersson, A. (2019). The public value of E-Government–A literature review. *Government Information Quarterly, 36*(2), 167-178.

United Nations. (2020a). *E-Government Survey 2020. Digital Government of Action For Sustainable Development*. publicadministration.un.org

United Nations. (2020b). *UN E-Government Knowledgebase*. https://publicadministration.un.org/egovkb/en-us/

Utterback, J. M. (1971). The process of technological innovation within the firm. *Academy of management Journal, 14*(1), 75-88.

van der Heijden, H., Verhagen, T., & Creemers, M. (2001). *Predicting online purchase behavior: replications and tests of competing models.* Paper presented at the Proceedings of the 34th annual Hawaii international conference on system sciences.

van Riel, A., Lemmink, J., & Ouwersloot, H. (2001). Consumer Evaluations of Service Brand Extensions. *Journal of Service Research - J SERV RES, 3*, 220-231. doi:10.1177/109467050133003

Veeramootoo, N., Nunkoo, R., & Dwivedi, Y. K. (2018). What determines success of an e-government service? Validation of an integrative model of e-filing continuance usage. *Government Information Quarterly, 35*(2), 161-174.

Venkatesh, Morris, & Davis. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS quarterly, 27*(3), 425-478. doi:10.2307/30036540

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science, 46*(2), 186-204.

World Economic Forum. (2020). *A startup in Italy used 3D printing to make valves for COVID-19 patients*. Retrieved from https://www.weforum.org/agenda/2020/03/3d-printed-emergency breathing-valves-covid-19/:

Yildiz, M. (2007). E-government research: Reviewing the literature, limitations, and ways forward. *Government Information Quarterly, 24*(3), 646-665.

Zhang, X., & Maruping, L. M. (2008). Household technology adoption in a global marketplace: Incorporating the role of espoused cultural values. *Information systems frontiers, 10*(4), 403-413.

Zheng, Y., & Holzer, M. (2013). Explaining E-participation Diffusion at the National Level: An Examination of External Environmental Influences. *1*, 1-21.

Zheng, Y., & Schachter, H. L. (2017). The Impact of Administrator Willingness on Website E-Participation: Some Evidence from Municipalities. *Public performance & management review, 41*(1), 1-21. doi:10.1080/15309576.2017.1400988

## 9. Appendix

Table 3b

*Cronbach's Alpha*

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| Continuance to use1 | 6.18 | 0.924 | 0.562 | |
| Continuance to use2 | 5.68 | 1.307 | 0.562 | |
| Performance expectancy1 | 5.45 | 1.753 | 0.665 | |
| Performance expectancy2 | 6.16 | 0.800 | 0.665 | |
| Effort expectancy1 | 5.51 | 1.714 | 0.514 | |
| Effort expectancy2 | 5.48 | 1.575 | 0.514 | |
| Social influence1 | 9.18 | 5.609 | 0.491 | 0.392 |
| Social influence2 | 9.57 | 5.144 | 0.421 | 0.495 |
| Social influence3 | 9.68 | 6.551 | 0.336 | 0.605 |
| Facilitating conditions1 | 9.97 | 4.689 | 0.394 | 0.541 |
| Facilitating conditions2 | 9.74 | 4.484 | 0.439 | 0.472 |
| Facilitating conditions3 | 9.19 | 5.287 | 0.420 | 0.507 |
| Perceived fear1 | 20.37 | 65.904 | 0.705 | 0.898 |
| Perceived fear2 | 20.05 | 62.722 | 0.815 | 0.882 |
| Perceived fear3 | 18.83 | 64.598 | 0.739 | 0.893 |
| Perceived fear4 | 18.79 | 64.348 | 0.749 | 0.892 |
| Perceived fear5 | 19.79 | 61.971 | 0.825 | 0.880 |
| Perceived fear6 | 18.99 | 69.517 | 0.643 | 0.906 |
| Inertia1 | 8.79 | 5.309 | 0.670 | 0.429 |
| Inertia2 | 8.20 | 7.388 | 0.513 | 0.650 |
| Inertia3 | 9.14 | 6.924 | 0.434 | 0.742 |
| Perceived risk1 | 3.59 | 2.878 | 0.715 | |
| Perceived risk2 | 3.27 | 2.600 | 0.715 | |
| Resistance1 | 7.62 | 8.969 | 0.789 | 0.760 |
| Resistance2 | 7.47 | 9.106 | 0.820 | 0.734 |
| Resistance3 | 7.36 | 9.929 | 0.621 | 0.917 |
| Habit1 | 10.57 | 4.109 | 0.669 | 0.602 |
| Habit2 | 10.69 | 4.560 | 0.602 | 0.681 |
| Habit3 | 10.81 | 4.087 | 0.533 | 0.768 |
| Awareness1 | 12.78 | 17.165 | 0.792 | 0.804 |
| Awareness2 | 12.85 | 17.039 | 0.836 | 0.788 |
| Awareness3 | 12.82 | 17.972 | 0.766 | 0.816 |
| Awareness4 | 13.17 | 17.826 | 0.541 | 0.917 |
| Technology anxiety1 | 9.69 | 20.284 | 0.596 | 0.861 |
| Technology anxiety2 | 10.12 | 17.874 | 0.790 | 0.780 |
| Technology anxiety3 | 10.10 | 18.777 | 0.674 | 0.831 |
| Technology anxiety4 | 10.42 | 19.101 | 0.758 | 0.797 |

Table 4a

*Factor analysis. Component Matrix*

| Facilitators | Component 1 | Inhibitors | Component 1 | Moderators | Component 1 |
|---|---|---|---|---|---|
| Continuance to use1 | 0.884 | Inertia1 | 0.889 | Awareness1 | 0.911 |
| Continuance to use2 | 0.884 | Inertia2 | 0.794 | Awareness2 | 0.927 |
| | | Inertia3 | 0.705 | Awareness3 | 0.886 |
| | | | | Awareness4 | 0.698 |
| Performance expectancy1 | 0.912 | Perceived risk1 | 0.926 | Technology anxiety1 | 0.760 |
| | | Perceived risk2 | 0.926 | Technology anxiety2 | 0.894 |
| Performance expectancy2 | 0.912 | | | Technology anxiety3 | 0.823 |
| | | | | Technology anxiety4 | 0.874 |
| Effort expectancy1 | 0.870 | Resistance1 | 0.920 | | |
| Effort expectancy2 | 0.870 | Resistance2 | 0.932 | | |
| | | Resistance3 | 0.808 | | |
| Social influence1 | 0.811 | Habit1 | 0.873 | | |
| Social influence2 | 0.762 | Habit2 | 0.835 | | |
| Social influence3 | 0.667 | Habit3 | 0.774 | | |
| Facilitating conditions1 | 0.725 | | | | |
| Facilitating conditions2 | 0.771 | | | | |
| Facilitating conditions3 | 0.752 | | | | |
| Perceived fear1 | 0.800 | | | | |
| Perceived fear2 | 0.881 | | | | |
| Perceived fear3 | 0.822 | | | | |
| Perceived fear4 | 0.830 | | | | |
| Perceived fear5 | 0.889 | | | | |
| Perceived fear6 | 0.742 | | | | |

*Note:* Extraction Method: Principal Component Analysis

Table 4b

*Factor analysis. Communalities*

| Facilitators | Extraction | Inhibitors | Extraction | Moderators | Extraction |
|---|---|---|---|---|---|
| Continuance to use1 | 0.781 | Inertia1 | 0.790 | Awareness1 | 0.829 |
| Continuance to use2 | 0.781 | Inertia2 | 0.630 | Awareness2 | 0.859 |
| | | Inertia3 | 0.497 | Awareness3 | 0.785 |
| | | | | Awareness4 | 0.487 |
| Performance expectancy1 | 0.832 | Perceived risk1 | 0.857 | Technology anxiety1 | 0.578 |
| | | Perceived risk2 | 0.857 | Technology anxiety2 | 0.800 |

| | | | | | |
|---|---|---|---|---|---|
| Performance expectancy2 | 0.832 | | | Technology anxiety3 | 0.677 |
| | | | | Technology anxiety4 | 0.765 |
| Effort expectancy1 | 0.757 | Resistance1 | 0.846 | | |
| Effort expectancy2 | 0.757 | Resistance2 | 0.869 | | |
| | | Resistance3 | 0.653 | | |
| Social influence1 | 0.658 | Habit1 | 0.762 | | |
| Social influence2 | 0.581 | Habit2 | 0.696 | | |
| Social influence3 | 0.444 | Habit3 | 0.600 | | |
| Facilitating conditions1 | 0.526 | | | | |
| Facilitating conditions2 | 0.594 | | | | |
| Facilitating conditions3 | 0.566 | | | | |
| Perceived fear1 | 0.639 | | | | |
| Perceived fear2 | 0.777 | | | | |
| Perceived fear3 | 0.675 | | | | |
| Perceived fear4 | 0.689 | | | | |
| Perceived fear5 | 0.790 | | | | |
| Perceived fear6 | 0.550 | | | | |

*Note:* Extraction Method: Principal Component Analysis

Table 4c

*Factor analysis. Inter-Item correlations*

| | Effort expectancy2 | | Social influence1 | Social influence2 | | Facilit. Conditions1 | Facilit. Conditions2 |
|---|---|---|---|---|---|---|---|
| Effort expectancy1 | | Social influence2 | | | Facilit. Conditions2 | | |
| Pearson correlation | .514** | Pearson correlation | .438** | | Pearson correlation | .339** | |
| Sig. | 0.000 | Sig. | 0.000 | | Sig. | 0.000 | |
| | | Social influence3 | | | Facilit. Conditions3 | | |
| | | Pearson correlation | .329** | .247** | Pearson correlation | .313** | .375** |
| | | Sig. | 0.000 | 0.003 | Sig. | 0.000 | 0.003 |

*Note:* Correlation is significant at the 0.01 level (2-tailed).

Table 5

*Correlation Matrix for Independent variables*

| | Performance expectancy | Effort expectancy | Social influence | Facilit. Conditions | Perceived fear | Inertia | Perceived risk | Resistance | Habit | Awareness |
|---|---|---|---|---|---|---|---|---|---|---|
| Effort expectancy | | | | | | | | | | |
| Pearson Correlation | .557** | | | | | | | | | |
| Sig. (2-tailed) | 0.000 | | | | | | | | | |
| Social influence | | | | | | | | | | |
| Pearson Correlation | 0.014 | .020 | | | | | | | | |
| Sig. (2-tailed) | 0.864 | .810 | | | | | | | | |
| Facilitating conditions | | | | | | | | | | |
| Pearson Correlation | .273** | .380** | .140 | | | | | | | |
| Sig. (2-tailed) | 0.001 | .000 | .092 | | | | | | | |
| Perceived fear | | | | | | | | | | |
| Pearson Correlation | .028 | .066 | .208* | .111 | | | | | | |
| Sig. (2-tailed) | .733 | .428 | .012 | .181 | | | | | | |
| Inertia | | | | | | | | | | |
| Pearson Correlation | .038 | .004 | .379** | .118 | .155 | | | | | |
| Sig. (2-tailed) | .651 | .966 | .000 | .157 | .062 | | | | | |
| Perceived risk | | | | | | | | | | |
| Pearson Correlation | -.147 | -.185* | .041 | -.087 | .141 | .268** | | | | |
| Sig. (2-tailed) | .077 | .025 | .627 | .298 | .89 | .001 | | | | |
| Resistance | | | | | | | | | | |
| Pearson Correlation | -.302** | -.298** | .218** | -.065 | .165* | .394** | .499** | | | |
| Sig. (2-tailed) | .000 | .000 | .008 | .439 | .047 | .000 | .000 | | | |
| Habit | | | | | | | | | | |
| Pearson Correlation | .481** | .423** | .036 | .166* | .016 | .194* | -.076 | -.176* | | |
| Sig. (2-tailed) | .000 | .000 | .662 | .045 | .848 | .019 | .359 | .033 | | |
| Awareness | | | | | | | | | | |
| Pearson Correlation | .174* | .278** | .036 | .249** | -.018 | .116 | -.035 | -.061 | .263** | |
| Sig. (2-tailed) | .036 | .001 | .663 | .002 | .834 | .164 | .671 | .461 | .001 | |
| Technology anxiety | | | | | | | | | | |
| Pearson Correlation | -.268** | -.225** | .233** | .016 | .262** | .460** | .468** | .573** | -.125 | -.090 |
| Sig. (2-tailed) | .001 | .006 | .005 | .844 | .001 | .000 | .000 | .000 | .131 | .282 |

*Note:* **. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 6b

*Regression analysis for the effects of facilitators and inhibitors on Continuance of usage*

| | Unstandardized Coefficient B | Standardized Coefficient Beta | t | Sig. | Collinearity Statistics Tolerance | VIF |
|---|---|---|---|---|---|---|
| Constant | 2.681 | | 4.992 | 0.000 | | |
| Performance expectancy | 0.368 | 0.401 | 4.980 | 0.000 | 0.593 | 1.685 |
| Effort expectancy | 0.108 | 0.130 | 1.596 | 0.113 | 0.583 | 1.714 |
| Social influence | -0.075 | -0.088 | -1.281 | 0.202 | 0.809 | 1.235 |
| Facilitating conditions | 0.085 | 0.092 | 1.345 | 0.181 | 0.821 | 1.218 |
| Perceived fear | 0.033 | 0.056 | 0.872 | 0.385 | 0.919 | 1.089 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Inertia | -0.011 | -0.015 | -0.195 | 0.845 | 0.679 | 1.472 |
| Perceived risk | 0.067 | 0.111 | 1.518 | 0.131 | 0.725 | 1.379 |
| Resistance | -0.140 | -0.223 | -2.738 | 0.007 | 0.584 | 1.713 |
| Habit | 0.127 | 0.134 | 1.788 | 0.076 | 0.691 | 1.447 |

*Note:* Dependent Variable: Continuance to use

Table 7b

*Regression analysis for the effects of "Awareness" and interaction term "Performance expectancy X Awareness" on the "continuance to use"*

| Model 1 | | Unstandardized Coefficient B | Standardized Coefficient Beta | t | Sig. | Collinearity Statistics Tolerance | VIF |
|---|---|---|---|---|---|---|---|
| | Constant | 2.703 | | 4.998 | 0.000 | | |
| | Performance expectancy | 0.366 | .400 | 4.940 | 0.000 | .592 | 1.689 |
| | Effort expectancy | .113 | .135 | 1.639 | .103 | .572 | 1.749 |
| | Social influence | -.075 | -.089 | -1.283 | .202 | .809 | 1.236 |
| | Facilitating conditions | .090 | .097 | 1.396 | .165 | .799 | 1.251 |
| | Perceived fear | .032 | .055 | .840 | .402 | .915 | 1.093 |
| | Inertia | -0.10 | .-.012 | -.163 | .871 | .676 | 1.479 |
| | Perceived risk | .067 | .111 | 1.517 | .132 | .725 | 1.379 |
| | Resistance | -.140 | -.223 | -2.733 | .007 | .584 | 1.713 |
| | Habit | .132 | ..139 | 1.830 | .069 | .675 | 1.482 |
| | Awareness | -.021 | -.030 | -.450 | .654 | .864 | 1.158 |
| Model 2 | Constant | 2.718 | | 4.909 | 0.000 | | |
| | Performance expectancy | .364 | .397 | 4.788 | 0.000 | .567 | 1.764 |
| | Effort expectancy | .111 | .134 | 1.603 | .111 | .562 | 1.778 |
| | Social influence | -.076 | -.090 | -1.285 | .201 | .802 | 1.247 |
| | Facilitating conditions | .091 | .098 | 1.397 | .165 | .790 | 1.266 |
| | Perceived fear | .032 | .055 | .844 | .400 | .912 | 1.096 |
| | Inertia | -.010 | -0.12 | -.163 | .871 | .676 | 1.479 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Perceived risk | .066 | .108 | 1.427 | .156 | .678 | 1.475 |
| | Resistance | -.140 | -.222 | -2.700 | .008 | .579 | 1.727 |
| | Habit | .133 | .140 | 1.828 | .070 | .669 | 1.495 |
| | Awareness | -.020 | -.030 | -.439 | .661 | .861 | 1.162 |
| | Performance expectancy X Awareness | -.006 | -.009 | -.136 | .892 | .851 | 1.175 |

*Note:* Dependent Variable: Continuance to use

Table 8b

*Regression analysis for the effects of "Technology anxiety" and interaction term "Technology anxiety X Effort expectancy*

| Model 1 | | Unstandardized Coefficient B | Standardized Coefficient Beta | t | Sig. | Collinearity Statistics Tolerance | VIF |
|---|---|---|---|---|---|---|---|
| | Constant | 2.773 | | 5.170 | 0.000 | | |
| | Performance expectancy | 0.349 | 0.381 | 4.705 | 0.000 | 0.580 | 1.724 |
| | Effort expectancy | 0.103 | 0.124 | 1.531 | 0.128 | 0.582 | 1.717 |
| | Social influence | -0.071 | -0.084 | -1.226 | 0.222 | 0.808 | 1.237 |
| | Facilitating conditions | 0.094 | 0.101 | 1.480 | 0.141 | 0.816 | 1.226 |
| | Perceived fear | 0.045 | 0.076 | 1.166 | 0.246 | 0.888 | 1.126 |
| | Inertia | 0.018 | 0.023 | 0.300 | 0.765 | 0.621 | 1.610 |
| | Perceived risk | 0.086 | 0.141 | 1.887 | 0.061 | 0.682 | 1.466 |
| | Resistance | -0.116 | -0.184 | -2.186 | 0.031 | 0.539 | 1.856 |
| | Habit | 0.122 | 0.128 | 1.720 | 0.088 | 0.689 | 1.450 |
| | Technology anxiety | -0.093 | -0.142 | -1.668 | 0.098 | 0.523 | 1.911 |
| Model 2 | Constant | 2.861 | | 5.301 | 0.000 | | |
| | Performance expectancy | 0.347 | 0.378 | 4.681 | 0.000 | 0.580 | 1.726 |
| | Effort expectancy | 0.094 | 0.112 | 1.384 | 0.169 | 0.575 | 1.739 |
| | Social influence | -0.073 | -0.086 | -1.256 | 0.211 | 0.808 | 1.238 |
| | Facilitating conditions | 0.098 | 0.106 | 1.552 | 0.123 | 0.813 | 1.229 |
| | Perceived fear | 0.039 | 0.066 | 1.006 | 0.316 | 0.875 | 1.143 |
| | Inertia | 0.010 | 0.013 | 0.161 | 0.872 | 0.614 | 1.629 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Perceived risk | 0.080 | 0.131 | 1.753 | 0.082 | 0.675 | 1.481 |
| Resistance | -0.119 | -0.188 | -2.242 | 0.027 | 0.538 | 1.859 |
| Habit | 0.135 | 0.141 | 1.883 | 0.062 | 0.676 | 1.479 |
| Technology anxiety | -0.092 | -0.140 | -1.643 | 0.103 | 0.523 | 1.912 |
| Technology anxiety X Effort expectancy | 0.046 | 0.082 | 1.269 | 0.207 | 0.911 | 1.098 |

*Note:* Dependent Variable: Continuance to use