



E-Government Awareness and Adoption by the Residents: A Quantitative Analysis on North Cyprus

Anil Eyupoglu, Department of Management Information Systems, School of Applied Sciences, Cyprus International University, Cyprus

 <https://orcid.org/0000-0002-3291-6801>

Tugberk Kaya, Department of Management Information Systems, School of Applied Sciences, Cyprus International University, Cyprus

 <https://orcid.org/0000-0002-1796-2279>

ABSTRACT

This paper presents the results of an empirical survey study conducted on people living in North Cyprus, aiming to measure awareness of e-government practices. Brief information regarding e-government, awareness and adoption concepts, and current situation in North Cyprus is also provided. A particular survey is designed based on preliminary pre-testing methods and academic supervision. This study aims to contribute to a literature that is lacking studies regarding awareness of e-government in small islands. As Cyprus is a Small Island Developing State (SID) member and has the last divided capital, revealing the main reasons for awareness, usage and trustiness of e-government practices is believed to contribute to the literature.

KEYWORDS

E-Government, E-Government Awareness, Small Islands Developing States, Trust

INTRODUCTION

In an era that revolves around digitalization, information, and communication technology (ICT) serves for various purposes. Electronic government (e-government) is one of the biggest harvests of this. The concept of e-government involves applying information and communication technology to multiple aspects of a government's daily processes. It aims to "enhance access to and delivery of government services to benefit citizens" (Solintone & Romyantseva, 2016). This is simply achieved by enhancing the information flow between the government and citizens, which leads to a whole another way in which both parties interact. In simpler words, e-government services enable citizens to exploit IT to improve accessibility, convenience, and quality of interactions with the government.

On an exploratory study, Hu et al. (2009) concluded the following points that are dealt with e-government; significant management initiatives and delivery of information and public services,

DOI: 10.4018/IJPADA.2020040101

This article, originally published under IGI Global's copyright on April 1, 2020 will proceed with publication as an Open Access article starting on February 3, 2021 in the gold Open Access journal, International Journal of Public Administration in the Digital Age (converted to gold Open Access January 1, 2021), and will be distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and production in any medium, provided the author of the original work and original publication source are properly credited.

taken by all stages of government, on behalf of citizens and local businesses, involving using multi-ways of Internet, web site, system integration, and interoperability, to enhance overall services and as a key approach and strategy. It aims to enhance access to and delivery of government services to benefit citizens (Solinthone & Rumyantseva, 2016). This is simply achieved by enhancing the information flow between the government and citizens, which leads to a whole another way for both parties to interact. Due to this, ICT plays a vital role in the e-government concept.

By changing the management and transforming existing governmental processes, e-government tends to strengthen the government's drive toward more transparent and effective governance. Dudley et al. (2015) stated that transforming service delivery begins with understanding citizens' needs and priorities. In such a user-centric or this case citizen-centric, approach various measures should be studied to ensure effectiveness. Reddick (2005) categorized the adoption of e-government into two groups as the supply and the demand-side. This study is concentrated on the demand-side, which is the residents.

The first aim of this paper is to understand how aware the locals are, living in the Northern part of Cyprus, of available e-government services. Secondly, statistical analysis is aimed to reveal how adopted those available services are. An empirical study approach is followed to measure awareness and adoption via an online survey. Despite literature having a substantial amount of studies measuring awareness via the method of surveying, this study aims to offer a considerable contribution to various stakeholders of Small Islands Developing States (SIDS). Separating aware and unaware citizens with reasons is believed to provide a better understanding. Also, due to its political state and the well-known Cyprus dispute, it is believed that this study is going to reveal how e-government awareness and adoption can relate and demonstrate to the country's situation. Furthermore, it is aimed to clarify whether physical isolation creates digital isolation as well. The findings of the research can be used to understand and develop a strategy to promote awareness and adoption for SIDS.

BACKGROUND

The e-government concept came to light with the advent of government websites in the late 90s (Mittal et al., 2013). The web provides transparency in functioning, which gives the potential to supply a corruption-free government (Saxena, 2017). It is vital to embark on the use of technology across governmental structures. Computers were being used independently for specific purposes which were causing isolation and disconnection among the governmental units. ICT has such a high potential that, using it only for automation would be inefficient (Dwivedi, Papazafeiropoulou, Gharavi & Khoumbati, 2006).

After the potential was realized, the first e-government systems started to appear. However, initial e-government systems had limited functions and had been implemented by a few governments for some reason (Meftah, Gharleghi & Samadi, 2015). Overall, e-government aims to increase citizens' participation and enhance their access. E-government touches on pretty much all aspects of citizens' relationship with the government (Abu-Shanab, 2017). It serves to the delivery of government-related processes via the utilization of ICT. E-government concepts, as researched and practiced over the past two decades, continues to evolve (Janowski, 2015). For citizens, the perks of such services are; greater access and easier interaction with the government, and for the government, perks are lower service delivery costs and a completely different channel to engage with citizens (Venkatesh et. al, 2016).

As its role serves both citizens and the government, countries are seeking different ways and technologies to implement e-government services and achieving these results in a better integration, management, sharing, and transfer of information between government and citizens (Behzadi et al., 2012). That is utterly proportional to the level of ICT deployment, which depends on the development status of the country.

As mentioned above, it is important to approach the e-government concept not just through the government's perspective, but also through the citizens' perspective. Citizens, as essential stakeholders

in the process, do have a collective expectation from a possible e-government service (Twizeyimana and Andersson, 2019). Belanche, Casaló and Flavián (2010) prove that citizens' expectations positively affect their intention to use that service. Banu Ali, Saleh Wafer and Ramlogan (2019) stated some factors that have an important impact on citizens' intention to use e-government services. These factors involve; trust in the Internet, trust in Government awareness, lack of policy and regulation for e-usage, information communication technology (ICT) infrastructure and most importantly, citizen's participation. E-government can improve this trust through citizen participation, and by providing the public with more control of actions and decisions of their government (Castelnovo, 2013). Finally, Baxter (2017) stated the fact that citizens' participation plays a significant role in determining the success of e-government adoption.

Adoption and Awareness

Both awareness and adoption have been popular research topics across e-government literature despite being proven as the most challenging (Meftah, Gharleghi & Samadi, 2015). As Ozkan and Kanat (2011) stated, adoption measures determine the success of the government to citizens. There have been many types of research focusing on the adoption of e-government using various models such as the Technology Acceptance/Adoption Model (TAM). As more studies have been carried out, this has led many researchers to focus on the factors that influence citizens' adoption of e-government. Initial findings showed that the demand for e-government is deficient, which has led to even more research that aims to identify factors affecting this demand. According to Shareef et al. (2011), public administration can obtain potential implications and insights from the findings of the adoption behavior of e-government at different maturity levels. This public administration, including policy and decision-makers, need to know the issues that might affect users' decision instead to use a particular system (Simtowe, 2012). These identified issues can then be taken into consideration during the development phase. Simtowe (2012) stated that "technology diffusion (awareness) is an important precondition for adoption to occur". Therefore, it is significant to focus on these both concepts, respectively. Through the review of literature, it has been found out that this is roughly the leading approach researchers use when talking about adoption and awareness.

Meftah, Gharleghi and Samadi (2015) conducted an empirical study to identify the factors that affect citizen's intention to adopt e-government services from some perspectives. Respondents have been selected through a convenience sampling method. The targeted population included private-sector employees of Bahrain city, and surveys have been carried out for three months. Through a regression analysis, a significant relationship has been found between e-government and culture, e-government and awareness and e-government and trust. Amongst these three relations, trustiness is the one with the most reliable relationship. That briefly means that trusting the system has a substantial effect on the adoption process. Another similar study has been carried out by Al-hashmi and Suresha (2013), where the main focus was to measure the level of awareness in the Republic of Yemen. Researchers used a random sampling method and collected responses from 750 people. The questionnaire used was also validated through the professionals and extensive literature review. By this evaluation, they reduced the risk of potential ambiguity and confusion some respondents might face. Overall results showed a little amount of awareness with females being the lowest gender group. High literacy rate and young population of Yemen have also been mentioned during the analysis section.

Abu-Shanab (2017) applied another approach where two different sample models have been created with two different objectives. For each sample model, a survey has been conducted. Through an extensive literature review, 20 e-government related concepts have been selected to compose the first survey. These concepts included providing e-government services to citizens from different settlement areas, age groups, genders. Concepts focusing on the supply-side (administration) were also involved. For the second model, the researcher took four success factors as the core for the survey; ease of use, privacy, security and trustiness. For the first sample model of Jordanian students, the study indicated a high amount of perception of all e-government concepts. The highest means were

reported for service provision and social influence of e-government. For the second model, a class including undergraduate students were given the survey both at the beginning and end of the semester. Both the results of the second model alone and comparison to the first one indicated that familiarity with e-government has a significant influence on e-government perceptions.

Rehman et al. (2016) focused on different levels of service maturity while focusing on the factors that might have an impact on citizens' adoption of e-government services in Pakistan. Also, a conceptual model has been proposed. For the empirical approach, a quota sampling method has been used for two different groups of citizens (online and offline users). They recommended that the usage level of e-government should be considered carefully for a better understanding of citizen demands. Also, the lack of ICT availability has been pointed out, and it's been suggested for the government to provide these for better access.

Anna Xiong (2006) focused on the current status of Chinese e-government maturity by a comprehensive review of the literature and the government reports. More than ten years ago, it was found out that both the awareness and usage of e-government was very low. Also, the need for training and assistance has also been stated. The study by Reddick and Zheng (2017) on the mobile government in Chinese local governments, identified the strongest predictors of both current and future use as demand and satisfaction with mobile applications. Also, the results have indicated that socio-economic status did not have an impact on citizens' future use of mobile apps.

Finally, a cross-national study has been conducted by Carter, Weerakkody, Phillips and Dwivedi (2016) where the main focus was on conspicuous concepts that potentially affect citizen adoption of e-government. Initially, the study stated the lack of cross-country studies and identified itself as a preliminary one for further research. They stated that "due to the global presence of citizens in different countries, it is necessary to understand factors affecting adoption of electronic government services in a cross-country context." (Carter et al., 2016). Kaya (2020) investigated the usability of the official websites of the Asian countries and recommended to increase the tools to e-participate and shift towards user-centric design.

E-Government Services in Small Island Developing States (SIDS)

SIDS is usually acknowledged with the significant challenges they need to manage due to the natural characteristics of their environments and governance communications (Sari, 2016). Just like any other, governments in such situations have many attempts regarding enhancing service delivery through the means of e-government. For example, in the early stages of e-government integration, SIDS showed progress towards enhanced environmental sustainability through e-government (Lee, 2017). Considering the ICT involvement in the e-government concept, the fact that SIDS have limited resources causes challenges (Sari, 2016; United Nations, 2018). Some of this could be due to technical expenses or computational resources required. Kaya (2019a) informed that artificial intelligence-driven decision making is available due to the recent developments while the availability of data is a concern within SIDS. Furthermore, the lack of a legal framework is also a barrier towards e-government development (Kaya, 2019b).

According to the United Nations' E-Government Survey 2018, e-government development is most influential in SIDS, and Singapore is the one with the highest progress (United Nations, 2018). An example provided in the survey is Singapore, with significant progress since the previous edition and has historically had a very-high-EGDI score. Also, it has been stated by the United Nations (2018) in the survey that more than half of the countries that moved from Middle to High EGDI level group belong to SIDS. Furthermore, it has been mentioned that this indicates the fact that many SIDS are already well advanced in implementing e-government policies and strategies and incorporating these into their development plans and policies.

E-Government Services in North Cyprus

As a developing country, Cyprus is in a dispute situation that affects citizens in many ways. Altınay et al. (2016) stated that the Cyprus problem (aka Cyprus Dispute) restricts the enrichment of education systems and the formation of identity. Availability and transparency of national governments are also one of the ways that affect the citizens. Due to the current situation and being politically unstable, North Cyprus is in a restricted state. In a situational analysis, Kaya et al. (2016) stated that only half of the local municipalities in North Cyprus have a website with room for many improvements especially considering the enhanced stage of e-government. Kaya and Över (2019) mentioned that municipality websites were used more efficiently and actively than ministry websites.

According to the United Nations' E-Government Survey 2018, Cyprus has an EGDI (E-government Development Index) greater than 0.75, placing it in the Very High EGDI (VH-EGDI) group. It has also been stated in the same report that Cyprus has advanced from a lower EGDI group to a higher one since the previous edition. The survey report is carried out by the United Nations on the 193 Member states. Despite Cyprus being in the list and placing in the VH-EGDI group, this does not show anything regarding North Cyprus. The situation in Cyprus (Cyprus Conflict) excludes North Cyprus from this well-known survey. This is another motivation for this study.

As a result of a detailed literature search using relevant keywords, a lack of studies regarding adoption and awareness of e-government in North Cyprus has come to light. Sağsan and Yıldız (2010) also mentioned this by stating “analyses of e-government adoption in the Northern part of the island are almost non-existent”. Kaya et al. (2020a) conducted interviews on decision-makers and analyzed that importance given to e-government practices increased while the level of importance changes depending on the decision-maker. Kaya et al. (2020b) carried out a study aiming to propose methods for improving e-government based processes. They followed an approach involving variable identification that influences e-government usage in Northern and Southern Nicosia. They focused on determining similarities and differences between the two parts of Nicosia. This study has a significant highlight as Nicosia is the world's last divided capital and comparisons in such situations are very rare. The impact of this isolation on digitalization was also studied. The research indicated that the potential e-government benefits positively affect the use of e-government practices for both parts. Also, nepotism negatively affects the e-government practices, where social media and human rights also have a positive relationship with the e-government services of Northern Nicosia. It is argued that as the country is a recognized EU member, Southern Nicosia respondents are keener to have more up-to-date concepts. For instance, as the European Union (2017) states, having a mobile government is an essential target for European Union Countries. Also, public sector organizations were rated poorly in potential benefits and improvements for e-government practices.

Sari (2017) stated the importance of The Corruption Problem in Cyprus and stated that “the rate of corruption has become an inevitable factor for evaluation.” in the concept of e-government. The CPI (Corruption Perceptions Index) score of Cyprus has not significantly increased or decreased within the last ten years but steadily shifted from 63 to 58 last year (Transparency International, 2020). Despite the study suggesting the use of ICT in e-governance leading to lower corruption (Lupu & Lazăr, 2015; (Nam, 2018), The CPI score of Cyprus shows that there is no significant impact of deployment of e-government on the prevention of corruption in Cyprus. As stated by Sari (2017), “It requires time for adoption and distribution of usage to create a possible interaction in society with e-government services to investigate the impact and measure of the corruption”. However, it can still be stated that, as Cyprus is still being developed socially and economically, the impact of corruption management through e-government is still a strong effort. Efficient corruption management can contribute more effectively to transparency of government. According to Venkatesh et al. (2016, p. 106), “Transparency and trust showed significant mediating and moderating effects on the relationships between the relevant factors and citizens' intentions to use e-government.”

In a document reviewed by Sağsan and Yıldız (2010), which was an e-readiness survey carried out by United Nations Development Program (UNDP, 2007), a digital divide has been identified

regarding settlement areas, incomes, educational background and age. Also, according to the same study, it has been found out that the demand for e-government was at low levels. It has stated that more than half of the participants said “no need to use computers”. Also, the fact regarding government websites being static and involving one-way interaction have been found out.

Based on the E-Government Development Stage Model (Wirtz & Daiser, 2015), this indicates the very first stage, which is presentation and information where static content is provided without any personalization or interaction. Considering the year this study (UNDP, 2007) was conducted and the availability/reliability of the Internet back in those days, these results could be expected. However, due to the infrastructural and technological developments, it is believed and further proven to be changed. This is the part where this study’s potential contribution comes into place. Via this research, it is believed that a substantial contribution can be offered to public administration or any stakeholder interested in the current situation of North Cyprus regarding e-government.

METHODOLOGY

Objective

This study aims to measure awareness of available e-government services among citizens of North Cyprus. The empirical research approach is used via distributing an online link that directs to a survey hosted on Google Form. So the main objectives are:

- To measure awareness of available e-government services among people living in North Cyprus
- To identify the potential relationship between respondents demographic variables and awareness
- To identify trustiness across e-government services by the respondents that are aware
- To identify potential trustiness across e-government services by the respondents that are not aware

Sampling

Sampling theory simply relies on probability sampling, where each person in a population is known and has a chance of involving (Wolf, Joye, Smith & Fu, 2016). The process of selecting respondents involves randomization without any purposive selection (Wolf, Joye, Smith & Fu, 2016). However, in this study’s case, due to the total population being unknown and due to time limitation, the non-probability sampling method is used. Unlike probability sampling where randomization is carried out, here it depends on the subjective judgment of the researcher. The targeted population for this research is the people currently living in North Cyprus. They do not necessarily have to be citizens of the North and can simply be residents.

Challenges

Ciochetto & Haley (2016) identified the following obstacles regarding survey studies aiming to measure awareness:

- To measure what people know as well as what they do not know
- Providing “do not know” option to avoid respondent making a guess
- It is socially desirable to appeal well-informed, but this is not easy with “do not know.”
- The likelihood that some of the respondents will affirm knowledge that they do not have
- Introduction to the question should be making the respondent feel free to pick “do not know.”

Another challenge for this study has been the language barrier. As the research is focused on people currently living in North Cyprus, it does not necessarily mean they all speak the same language. Also, some people tend to feel more comfortable using their mother language for sharing and expressing

themselves. Therefore, the survey was prepared and conducted in two languages; English and Turkish (primary language used in North Cyprus). Further details regarding the combination of results are explained in the following Survey Design section.

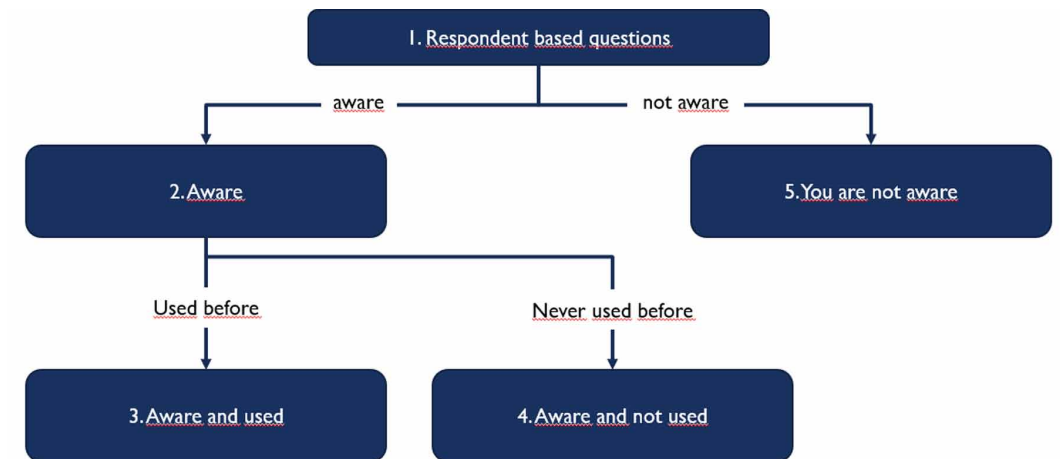
Survey Design

For designing the survey, literature has been reviewed besides consulting with an academic professional. Before actually implementing the study online, few pretesting methods were used to predefine the questions. This has been carried out by some cognitive think-aloud interviews to find out potential respondent responses. This preliminary study helped with a better survey design.

The survey has been designed as five sections. The significant feature of this survey is that all the sections except the first one are shown based on the respondent's answer given to specific questions. For example, at the end of the first section, the main question of "Are you aware of e-government services available in North Cyprus?" is asked. A "yes" answer to this question directed the respondent to Section 2, which only related to people who are considered as "aware of e-government". On the other hand, a respondent with a "no" answer given to this question has been directed to the last section skipping all the other unrelated questions.

By this way, time efficiency has been ensured for the overall survey experience. The general relation between sections is shown in Figure 1.

Figure 1. Survey design



Section 1 of the survey included multiple choice and checkbox questions focusing on respondent's profiles (age, nationality, location, occupation, etc). Section 2 is for the respondents who are considered Aware. This section involved two multiple-choice questions. Based on the second question, respondents who Used at least one e-government service before are directed to Section 3. In this section, five checkbox questions, one multiple choice question and one multiple-choice grid question are involved.

On the other hand, respondents who Never Used any e-government service before are directed to Section 4, which involved one multiple-choice grid question. Finally, Section 5 is for the respondents who are considered Not Aware. This section involved two multiple choice and one checkbox questions. Another critical design feature used in this survey was initially identified via the pretesting method carried out. When some potential respondents were asked "Do you consider yourself aware of e-government services?" face-to-face, answers were usually "No" or "I think No". However, some of them were aware and active users of e-government services without knowing that these services are

being referred to as “e-government”. This leads to another issue regarding the concept is not known but used at the same time. This is believed to be a further improvement for this study. So, to solve this issue, the survey had to be re-designed with some additional explanations being added to questions.

As shown in Figure 2, further detail was added to the question by using a straight-forward language as possible. Also, the examples given in brackets are currently the most popular e-government services in North Cyprus. This was believed to remind people the services are actually referred to as “e-government”.

Figure 2. “Are you aware of E-government services available in North Cyprus” question

Are you aware of E-Government services available in North Cyprus ? *

E-Government services are all of the online public services delivered by a government or semi-government (partnership) organization to citizens following the laws and regulations of a nation state describing rights and duties. (Ex: Governmental unit portals, municipality portals etc.)

☐ Yes

☐ No

Another challenge tackled with the design was the language barrier. As explained in the previous section, it cannot be assumed that everyone knows English. People from different age groups, educational background or personal preferences, might only be able to fill Turkish surveys. To avoid the potential exclusion of a reasonable amount of respondents, after completion of pretesting, two surveys were implemented. It is important to note that both of the surveys have the same question where the researcher did translations.

Additionally, at the end of the survey, respondents were given a chance to put key (generated by name & surname initials) in case they wanted to withdraw for any reason. After the completion of the survey, nobody reached out to be withdrawn from the survey.

Survey Distribution and Data Integration

As described above, both of the surveys were created and implemented in Google Forms. Google Forms is a web application that allows users to create questionnaires and share them publicly or privately. It is a free tool and has been used for a lot of research studies (Djenno, Insua & Pho, 2015). It also allows the survey owner to export results in various formats, including *xlsx* (spreadsheet format). By this way, it can be used in any data analysis tool. When the surveys were created on Google Forms, they were made publicly available. Two links (one for the Turkish version and one for the English version) were taken from the system and used when sharing with targeted respondents. Shortened versions of links were used. As a non-probability sampling method is used based on the subjective judgment of the researcher, the link was shared via social media, e-mail, SMS and direct messages. The surveys were active between the period of April and May 2020. While distributing, both of the links were shared, leaving the language preference to the potential respondent.

As of 25th May 2019, both of the surveys were deactivated. Initially, the results of both Turkish and English versions were exported. Then Turkish results were integrated into the English one. As both of the surveys used the same question structure, the results effectively combined. The only challenge was answered being different as language differed. In order to do that, Turkish version results were

translated back to English after the integration. After completing the translation, the resulting list included all the responses in English in one *xlsx* file.

FINDINGS

Respondents Profile

A total of 342 people have completed the survey, and the general respondents' profile is shown in Table 1. The same table also provides frequency distribution amongst some variables that are believed to place significant findings.

Table 1. Respondents profile

Variables	Options	Number of Respondents	Percentage
Age	18-24	30	8.77
	25-29	122	35.67
	30-34	100	29.24
	35-39	35	10.23
	40-44	16	4.68
	45+	39	11.40
Nationality	TRNC	246	48.52
	Cyprus	138	14.00
	TR	71	27.22
	Other	52	10.26
Education Degree	Middle/High School	24	7.02
	Undergraduate	150	43.86
	Postgraduate	131	38.30
	PhD	37	10.82
	No academic background	0	0
Income (TRY)	No income	40	11.70
	< Minimum wage	24	7.02
	Minimum wage	39	11.40
	Minimum wage - 6000	145	42.40
	6000+	94	27.49
Settlement Area	Urban	288	84.21
	Rural	54	15.79
Occupation Institution	Public Sector	56	16.37
	Private Sector	203	59.36
	NGO	14	4.09
	Unemployed	9	2.63
	Student	60	17.54

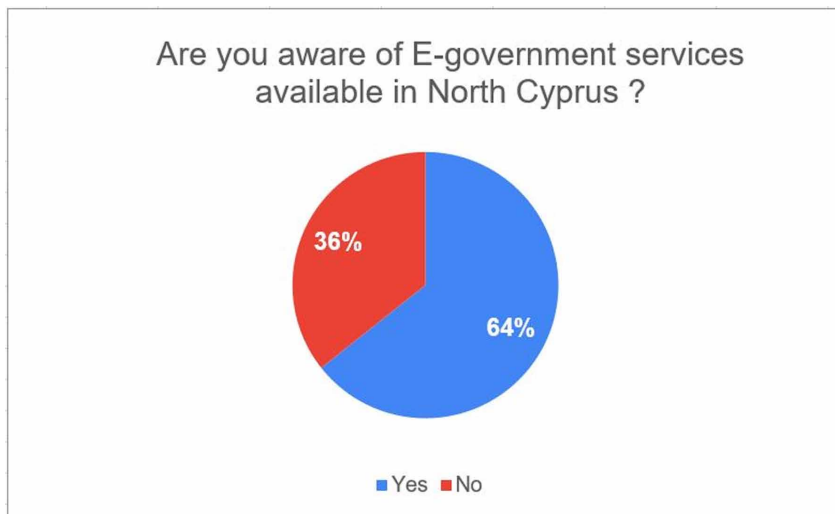
Awareness

In Table 2 and Figure 3, awareness results show that 64.3% of the respondents are aware of the e-government services in North Cyprus. Each option is reviewed in the upcoming sections.

Table 2. Awareness of E-government services in North Cyprus

Variables	Options	Number of Respondents	Percentage
Awareness	Yes	220	64.33
	No	122	35.67

Figure 3. Awareness of E-government services in North Cyprus



For the people who are not aware of the available services, almost 87.7% stated that they would use it if they knew about it. Interestingly, only 50% of these people said that they would trust the service if they knew about it, while 40% being not sure. The final question of this section was regarding the way people wish to be informed about the services. Results show that 74.5% would prefer an official statement by an administrative unit, or simply government itself. 44.3% also would prefer seeing a post or advertisement on social media.

Awareness vs. Demographic Variables

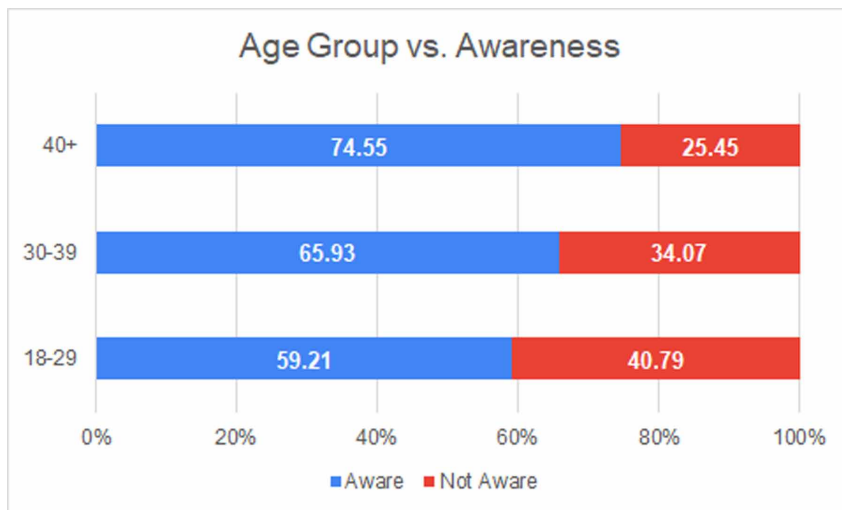
Awareness by Age Groups

From Table 3, awareness frequencies among age groups can be observed. For the most popular age group (25-29), it can be seen that 60.66% is aware. The most significant difference is in the 55+ age group, where 85.71% is aware. This can potentially be related to the case of retirement. However, in the context of the survey, this case is not considered. The results are also presented in Figure 4. The Chi-Square test of independence is applied and based on the calculations ($p = .00827$), the result is significant at $p < .05$. It can be stated that variables are dependent, and the relationship between age groups and awareness is significant.

Table 3. Awareness by age groups

Age	Aware		Not Aware	
	Freq	%	Freq	%
18-24	16	53.33	14	46.67
25-29	74	60.66	48	39.34
30-34	70	70.00	30	30.00
35-39	19	54.29	16	45.71
40-44	7	43.75	9	56.25
45-49	7	87.50	1	12.50
50-54	3	100.00	0	0.00
55+	24	85.71	4	14.29

Figure 4. Age group vs. awareness



Awareness by Education

From Table 4, awareness frequencies among different educational backgrounds can be observed. For the most popular educational background (Undergraduate), it can be seen that 62.67% is aware. Following this is the people with a Master's background, which is 61.83%. The most significant difference is in people with a Ph.D. background, where 83.78% is aware. This can be reasonable as people from more strong academic backgrounds tend to research more which might result in a higher awareness rate. The results are also presented in Figure 5. The Chi-Square test of independence is applied and based on the calculations ($p = .071413$), the result is not significant at $p < .05$. It can be stated that variables are independent.

Awareness by the Occupational Institution

From Table 5, awareness frequencies among different organizational backgrounds/institutional backgrounds can be observed. For the most widespread occupational institution (Private sector), it can be seen that 62.07% is aware. The most significant difference is in people working in the public

Table 4. Awareness by education

Educational Background	Aware		Not Aware	
	Freq	%	Freq	%
Middle/High School	14	58.33	10	41.67
Undergraduate	94	62.67	56	37.33
Master's	81	61.83	50	38.17
PhD	31	83.78	6	16.22
No academic background	0	0	0	0

Figure 5. Educational background vs. Awareness

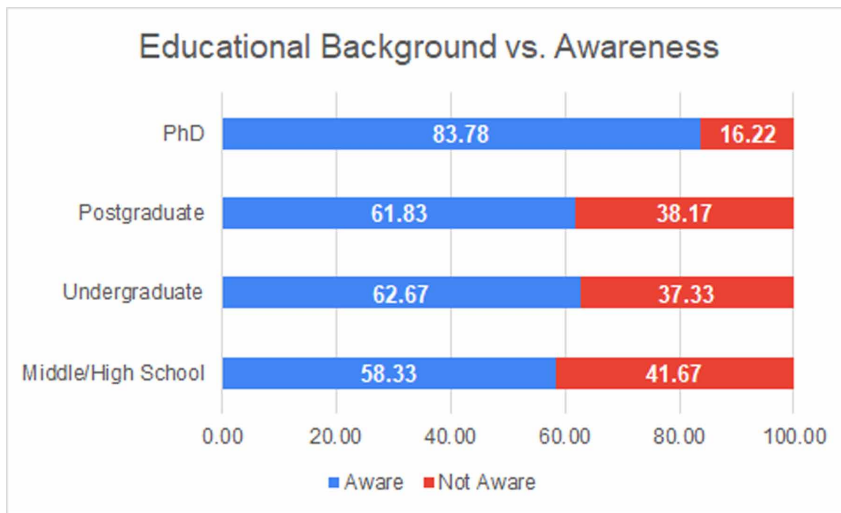
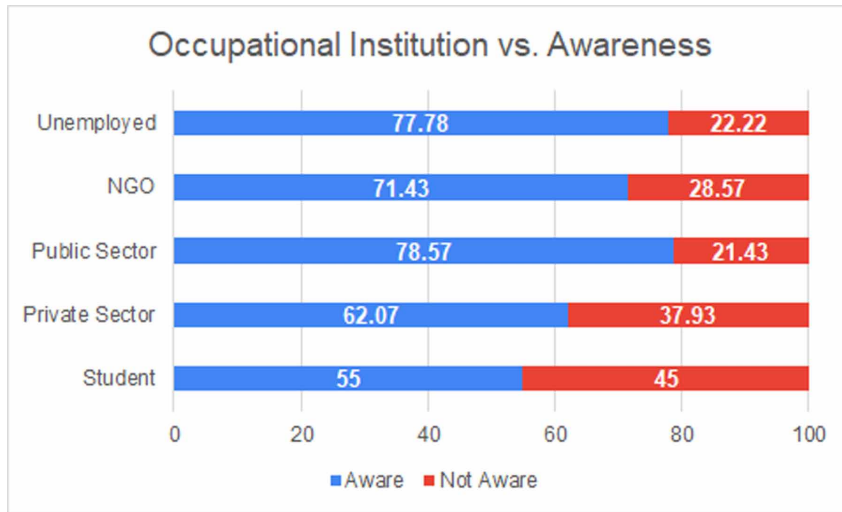


Table 5. Awareness by occupational institution

Occupation Institution	Aware		Not Aware	
	Freq	%	Freq	%
Student	33	55.00	27	45.00
Private Sector	126	62.07	77	37.93
Public Sector	44	78.57	12	21.43
NGO	10	71.43	4	28.57
Unemployed	7	77.78	2	22.22

sector, where 78.57% is aware. This can be related to the mandatory tasks given to public sector employees where they have to use e-government services as it is their task. An example of this is the MEB-NET Portal which is the system where teachers of state schools use to enter grades at the end of each term. They have to carry out this task through this portal as the final transcripts are approved via the portal. The results are also presented in Figure 6. The Chi-Square test of independence is

Figure 6. Occupational Institution vs. Awareness



applied and based on the calculations ($p = .069205$), the result is not significant at $p < .05$. It can be stated that variables are independent.

Awareness by Income Range

From Table 6, awareness frequencies among different income levels can be observed. For the most popular income level (in the range between minimum wage – 6000 TRY), it can be that 62.76% is aware. The income level with the most significant difference is for 6000 TRY+, which is 76.34%. The results are also presented in Figure 7. The Chi-Square test of independence is applied and based on the calculations ($p = .012891$), the result is significant at $p < .05$. It can be stated that variables are dependent, and the relation between income range and awareness is significant.

Table 6. Awareness by income range

Income	Aware		Not Aware	
	Freq	%	Freq	%
No income	26	65.00	14	35.00
< Minimum wage	13	54.17	11	45.83
Minimum wage	19	47.50	21	52.50
Minimum wage - 6000 TRY	91	62.76	54	37.24
6000+ TRY	71	76.34	22	23.66

Awareness by Settlement Area

From Table 7, awareness frequencies among two settlement areas can be observed. For the most famous settlement area (Urban), it can be seen that 64.58% is aware. The results are also presented in Figure 8. The Chi-Square test of independence is applied and based on the calculations ($p = .819567$), the result is not significant at $p < .05$. It can be stated that variables are independent.

Figure 7. Income range vs. Awareness

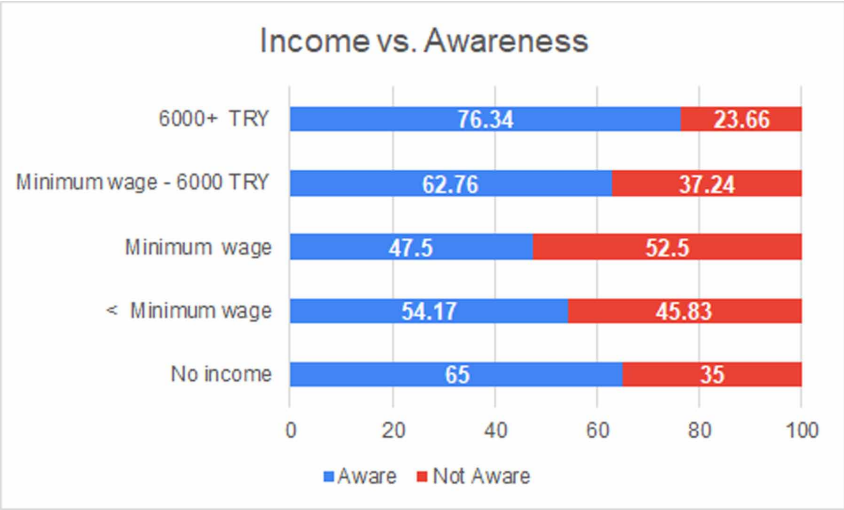
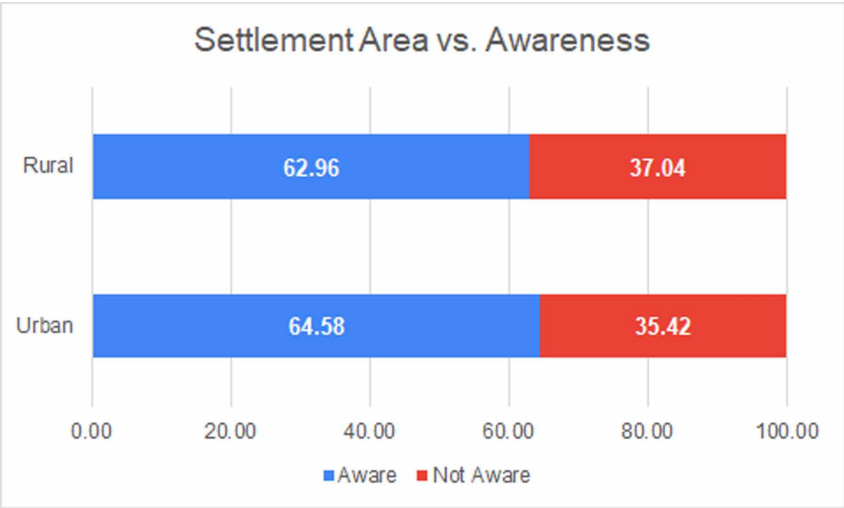


Table 7. Awareness by settlement area

Settlement Area	Aware		Not Aware	
	Freq	%	Freq	%
Urban	186	64.58	102	35.42
Rural	34	62.96	20	37.04

Figure 8. Settlement area vs. Awareness



Awareness vs. Usage

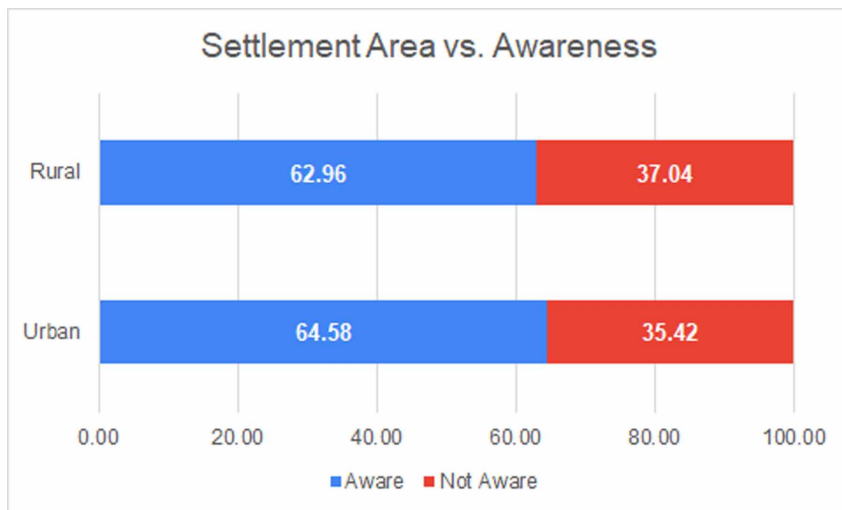
In Table 8, awareness and usage results are shown. It can be observed that almost 70% of the aware respondents actually used at least 1 of the e-government services in North Cyprus. The results are also presented in Figure 9.

Also, people were asked “How did you first hear about e-government services?” which revealed that 28% of them heard from governmental units/municipalities/local authorities and 25.5% from family/friends.

Table 8. Awareness and usage results

Variables	Options	Number of Respondents	Percentage
Aware & Used	Yes	153	69.55
	No	67	30.45

Figure 9. Usage of aware people

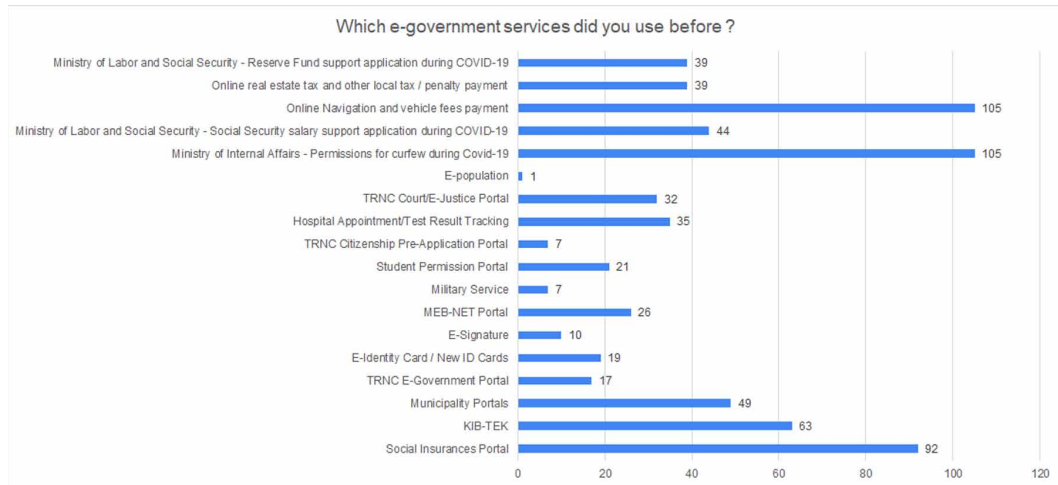


Social media plays an enhancing role and contributes as a bridge in e-government (Eom, Hwang & Kim, 2018). In a public environment where social media is kind of going ahead of e-government availability, it was expected that it positively impacts citizens' awareness regarding e-government. However, the study suggested that only 23% of respondents became aware of e-government from social media.

Aware and Used

For people who are aware of and used e-government before, service-based questions are asked. That is considered as one of the most significant sections of the survey. Initially, 18 e-government services are listed. These are the services that are publicly announced and in use. In Figure 10, this list with the usage frequency is shown. It can be observed that the most popular e-government services are Online Navigation and vehicle fees payment and the Ministry of Internal Affairs - Permissions for curfew during Covid-19 with 68% of active usage. Following these are the Social Insurances Portal with 60% usage. This service has been up since 2012 (“Online İşlemler”, 2019). This result is

Figure 10. List of e-government services provided in the survey and frequency of people



expected as checking social insurance status, salary plans, pension schemes, etc. are popular actions amongst employed people. Following popular services are KIB-TEK (publicly owned electricity company), and Municipality Portals (41.2% and 32.03% respectively), which are again expected as both of these services allow registered people to make payments for their household bills. These services also provide information regarding debts; therefore, it could be mentioned that citizens are using e-payment practices.

Furthermore, regarding the devices people use to access, 63.4% prefer smartphones, while 60.1% prefer laptops. High e-payment indicates that citizens who are using the e-government portals do not have hesitation in using payment feature, which is promising due to several reasons. Firstly, e-payment enables the continuation of government services without physical disruption. Secondly, the COVID-19 pandemic highlighted the importance of digital transactions that need citizen acceptance and usage of the available systems.

Another question asked to people was regarding the reasons for using services. It has been found out that 77.78% of people use it because they find it “useful” and “time-saving”. Considering the actual aims of implementing e-government, this is a positive result showing that it serves its purpose in North Cyprus. Full results are shown in Table 9.

Table 9. Reasons of using e-government services

Statement	Number of Respondents	Percentage
I don't have time to visit governmental units	72	47.06
I find it useful and time saving	119	77.78
I don't have any other option	9	5.88
I don't know any other way to access services	6	3.92
I have to use it due to my work responsibility	32	20.92
It takes longer to carry out some tasks in physical	75	49.02

The statement related to trustiness highlights that 52.94% of users do trust the services that they are using. Also, respondents declared that they trust the service provider. Almost 39.87% of users also said they do not trust e-government practices but still use them as it makes their life more comfortable (Table 10).

Table 10. Trust-related statements

Statement	Number of Respondents	Percentage
I trust the service & service provider	81	52.94
I don't trust but still use it as it make my life easier	61	39.87
I don't trust but still use it because I don't have any other option	21	13.7

Regarding recommendations, the majority of the active users (81.7%) said that they would recommend e-government services to their friends and family.

At the end of this section of the survey, a general question was asked with various statements included. Options were given in a range from Strongly disagree to Strongly agree. Results are reviewed as followings:

- Almost 67% of active users agreed on that overall services are simple to use
- 62% of the active users strongly agreed on that overall services are easy to understand
- Regarding the information they are getting being clear and enough; 49.6% agreed while 29% being neutral
- Regarding the error messages provided by the system, 65% stated that they are neutral or disagree
- 58% of the active users agreed on the language being clear and as users feeling comfortable with the system
- 64% of the active users agreed on being able to complete their intended operation successfully
- 55% of the active users stayed neutral or disagreed on the availability of instructions and FAQs.

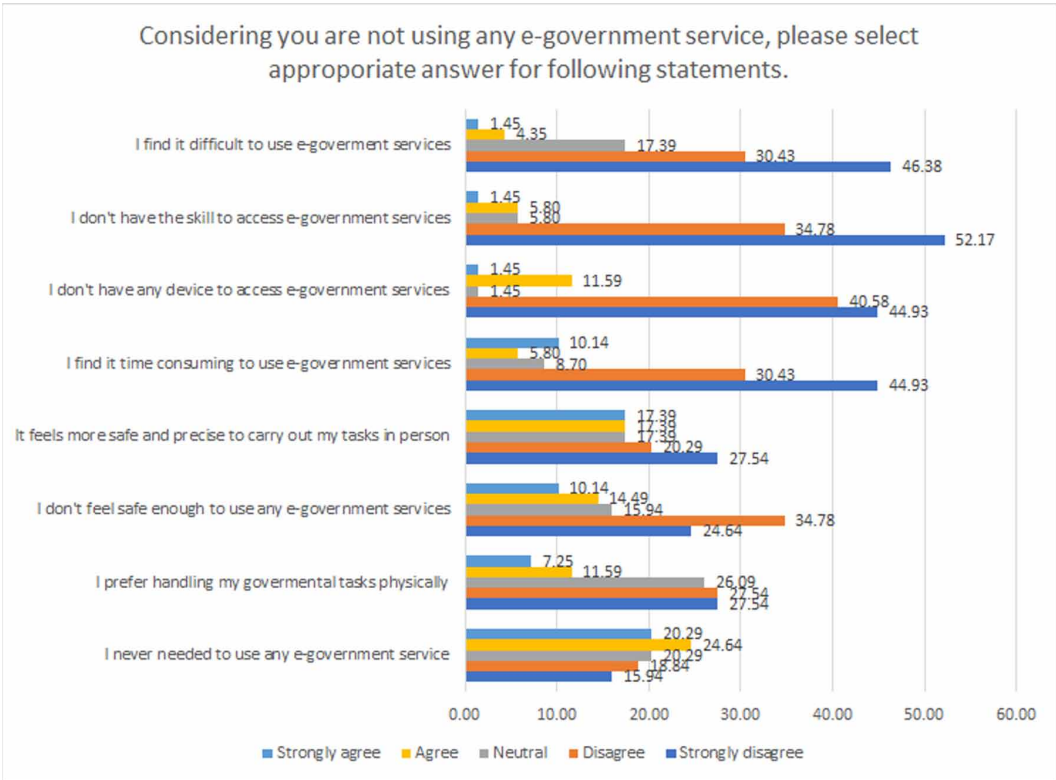
Aware and Not Used

For the people who are aware of the services but never used before, a general question was asked with various statements included. Options were given in a range from Strongly disagree to Strongly agree. For this section, all of the results are shown the majority of negativity. In more simple words, it seems like the majority of respondents did not positively agree on the statements provided. Therefore, from this piece of data, no insight is drawn as it is believed to be not efficient enough. Part of the results is shown in Figure 11.

CONCLUSION

Awareness of available e-government services among people living in North Cyprus is 64.3% based on this study. The relationship between respondents' demographic variables and awareness is also stated. Another significant concept that is evaluated through this study is the trustiness factor. 52.94% of active users seem to be trusting the service and service provider. The same factor for the unaware people showed 50%, which stated they would trust the service if they knew about it. It was surprising that there are users who are using e-government practices, but they are not aware of it. The circulation of e-government practices via decision-makers can increase the awareness and usage of it. The users

Figure 11. Part of statements regarding people who are aware and not used before



find e-government practices useful and a time saver which is a good indication. It is advised that the e-government concept is circulated as a theoretical concept rather than ideological to increase its adaptation. It was promising that e-government practices are used significantly during the COVID-19 pandemic. Authors argue that COVID-19 increased the digitalization of public sector organizations as well as the acceptance of digital services by citizens. The results of this research will be useful for decision-makers in several ways. As users are willing to use the system without trust issues, the benefits of using e-government practices should be circulated by the decision-makers. In order to that, discounts for using e-government practices can be provided. For example, a user can get a discount of 10% for the renewal of the driving license or road tax if the process is completed online. This will both benefit the user financially and efficiency as well. Providing a discount to enable the first use of the system also will help to increase awareness as it will create a word of mouth effect. Public authorities can also provide training to explain the use and related benefits of e-government practices. This can be done via central or local governmental units. As social distancing and group meetings are a concern and have potential risks due to COVID-19, these workshops can be organized online, which also conforms to the digitalization prospect. Furthermore, users' involvement for the electronic decision-making practices is really low as it is mentioned by the current UN E-Government Survey. Tools to increase electronic participation (e-participation) can be created whether the users will have the chance to declare their opinions electronically. This can be applied as a local or central level, and successful implementation can be expanded to other municipalities or regions. As the importance of digitalization is obvious and more demanded due to COVID-19 pandemic, being an active and participative leader on digital platforms is also gaining importance. The participatory medium will enable the chance for both users and decision-makers to take inclusive decisions. Successful case

studies can be used in other parts of the world where the e-government awareness or e-participation levels are low.

As Cyprus is a small island, there will be a tendency of completing public administrative tasks physically. E-government practices enable faster, accountable and effective ways of completing this task. It will be interesting and valuable to check e-government awareness in small island developing states and to see if there are any similarities and differences between the SIDS. Furthermore, longitudinal analysis of e-government analysis will be wise to examine to see the effects of government policies and their effect on e-government awareness. Mobile government and social media-driven e-government practices are the future of e-government so have a potential area to be researched as well. Awareness of m-government and social media government practices is a subject to research further.

As a further study, obviously, the first limitation is related to the respondent size. It should be increased, and more people should be reached to get even more efficient results. Furthermore, research can be conducted on the older age group (44+). Another potential improvement can be made to identify reasons for people being aware but not using any e-government service.

REFERENCES

- Abu-Shanab, E. (2017). E-government familiarity influence on Jordanians' perceptions. *Telematics and Informatics*, 34(1), 103–113. doi:10.1016/j.tele.2016.05.001
- Al-hashmi, A., & Suresha, S. (2013). Evaluating the Awareness of E-government in the Republic of Yemen. *International Journal of Computers and Applications*, 67(16), 41–45. doi:10.5120/11483-7185
- Altınay, F., Dagli, G., & Altınay, Z. (2016). Role of technology and management in tolerance and reconciliation education. *Quality & Quantity*, 51(6), 2725–2736. doi:10.1007/s11135-016-0419-x
- Anna Xiong, J. (2006). Current status and needs of Chinese e-government users. *The Electronic Library*, 24(6), 747–762. doi:10.1108/02640470610714198
- Banu Ali, M., Saleh Wafer, S., & Ramlogan, R. (2019). *Aspectual analysis of e-government adoption barriers: A citizens perspective*. British Academy of Management.
- Baxter, D. J. (2017). E-governance and e-participation via online citizen budgets and electronic lobbying: Promises and challenges. *World Affairs*, 180(4), 4–24.
- Belanche, D., Casaló, L., & Flavián, C. (2010). The Importance of Confirming Citizens' Expectations in e-Government. *IFIP Advances in Information and Communication Technology*, 341, 103–111. doi:10.1007/978-3-642-16283-1_14
- Carter, L., Weerakkody, V., Phillips, B., & Dwivedi, Y. (2016). Citizen Adoption of E-Government Services: Exploring Citizen Perceptions of Online Services in the United States and United Kingdom. *Information Systems Management*, 33(2), 124–140. doi:10.1080/10580530.2016.1155948
- Castelnovo, W. (2013). *A stakeholder based approach to public value*. Paper presented at the 13th European Conference on eGovernment ECEG 2013, Como, Italy.
- Ciochetto & Haley. (2016). *How do you measure "awareness"? Experiences with the lead-based paint survey*. Author.
- Djenno, M., Insua, G., & Pho, A. (2015). From paper to pixels: Using Google Forms for collaboration and assessment. *Library Hi Tech News*, 32(4), 9–13. doi:10.1108/LHTN-12-2014-0105
- Dudley, E., Lin, D., Mancini, M., & Ng, J. (2015). *Implementing a citizen-centric approach to delivering government services*. Retrieved from <https://www.mckinsey.com/industries/public-sector/our-insights/implementing-a-citizen-centric-approach-to-delivering-government-services>
- Dwivedi, Y., Papazafeiropoulou, A., Gharavi, H., & Khoubati, K. (2006). Examining the socio-economic determinants of adoption of the 'Government Gateway' initiative in the UK. Electronic Government. *International Journal (Toronto, Ont.)*, 3(4), 404. doi:10.1504/eg.2006.010801
- Eom, S., Hwang, H., & Kim, J. (2018). Can social media increase government responsiveness? A case study of Seoul, Korea. *Government Information Quarterly*, 35(1), 109–122. doi:10.1016/j.giq.2017.10.002
- European Union. (2017). *Cyprus. Overview*. Retrieved from https://europa.eu/european-union/about-eu/countries/member-countries/cyprus_en
- Hu, G., Pan, W., Lu, M., & Wang, J. (2009). The widely shared definition of e-Government. *The Electronic Library*, 27(6), 968–985. doi:10.1108/02640470911004066
- Janowski, T. (2015, July). Digital government evolution: From transformation to contextualization. *Government Information Quarterly*, 32(3), 221–236. doi:10.1016/j.giq.2015.07.001
- Kaya, T. (2019a). Artificial Intelligence Driven E-Government: The Engage Model To Improve E-Decision Making. *Proceedings of the 19th European Conference On Digital Government' (ECDG 2019)*. doi:10.34190/ECDG.19.054
- Kaya, T. (2019b). *The Maturation of Electronic Government Practices in Northern Cyprus: A Comparative Study of Northern and Southern Nicosia*. Lambert Academic Publishing.

- Kaya, T. (2020). E-Government Services in South Asia: Challenges and Opportunities. In G. D. Shama (Ed.), *Contemporary Issues in South Asia* (pp. 47–78). Nova Science Publishers.
- Kaya, T., Medeni, T., Sağsan, M., Medeni, İ., & Asunakutlu, T. (2016). A situation analysis for Northern Cyprus municipalities: Key success factors for effective participation. *International Journal of Ebusiness And Egovernment Studies*, 8(2).
- Kaya, T., & Över, A. S. (2019). Bakanlık ve Belediye Web Sitelerinin İçerik Analiz Yöntemiyle E-Katılımcılık Bağlamında İncelenmesi: KKTC Örneği. *Journal of Economics and Administrative Sciences*, 33(4), 1201–1226.
- Kaya, T., Sağsan, M., Medeni, T., Medeni, T., & Yıldız, M. (2020a). Qualitative analysis to determine decision-makers' attitudes towards e-government services in a de-facto state. *Journal of Information, Communication & Ethics in Society*.
- Kaya, T., Sağsan, M., Yıldız, M., Medeni, T., & Medeni, T. (2020b). Citizen Attitudes Towards E-Government Services. *International Journal of Public Administration in the Digital Age*, 7(1), 17–32. doi:10.4018/IJPADA.2020010102
- Lee, Y. (2017). Exploring the Relationship between E-Government Development and Environmental Sustainability: A Study of Small Island Developing States. *Sustainability*, 9(5), 732. Advance online publication. doi:10.3390/su9050732
- Lupu, D., & Lazăr, C. (2015). Influence of e-government on the Level of Corruption in some EU and Non-EU States. *Procedia Economics and Finance*, 20, 365–371. doi:10.1016/S2212-5671(15)00085-4
- Meftah, M., Gharleghi, B., & Samadi, B. (2015). Adoption of E-Government among Bahraini Citizens. *Asian Social Science*, 11(4). Advance online publication. doi:10.5539/ass.v11n4p141
- Mittal & Kaur. (2013). E-Governance-A challenge for India. *International Journal of Advanced Research in Computer Engineering & Technology*, 2(3), 1196.
- Nam, T. (2018). Examining the anti-corruption effect of e-government and the moderating effect of national culture: A cross-country study. *Government Information Quarterly*, 35(2), 273–282. doi:10.1016/j.giq.2018.01.005
- Online işlemler. (2019). Retrieved from <https://ssd.gov.ct.tr/giris/sigortali>
- Ozkan, S., & Kanat, I. (2011). e-Government adoption model based on theory of planned behavior: Empirical validation. *Government Information Quarterly*, 28(4), 503–513. doi:10.1016/j.giq.2010.10.007
- Paroški, M., Konjović, Z., & Surla, D. (2013). Implementation of e-Government at the local level in underdeveloped countries. *The Electronic Library*, 31(1), 99–118. doi:10.1108/02640471311299164
- Rana, N., & Dwivedi, Y. (2015). Citizen's adoption of an e-government system: Validating extended social cognitive theory (SCT). *Government Information Quarterly*, 32(2), 172–181. doi:10.1016/j.giq.2015.02.002
- Reddick, C. (2005). Citizen interaction with e-government: From the streets to servers? *Government Information Quarterly*, 22(1), 38–57. doi:10.1016/j.giq.2004.10.003
- Reddick, C., & Zheng, Y. (2017). Determinants of citizens' mobile apps future use in Chinese local governments. Transforming Government: People. *Process and Policy*, 11(2), 213–235.
- Rehman, M., Mustafa Kamal, M., & Esichaikul, V. (2016). Adoption of e-Government Services in Pakistan: A Comparative Study Between Online and Offline Users. *Information Systems Management*, 33(3), 248–267. doi:10.1080/10580530.2016.1188570
- Sağsan, M., & Yıldız, M. (2010). E-government in the Turkish Republic of Northern Cyprus. *Integrated Series in Information Systems*, 409–423. doi: 10.1007/978-1-4419-6536-3_21
- Sari, A. (2017). E-Government Attempts in Small Island Developing States: The Rate of Corruption with Virtualization. *Science and Engineering Ethics*, 23(6), 1673–1688. doi:10.1007/s11948-016-9848-0 PMID:27995444
- Saxena, N. (2017). *E-Government and E-Democracy: The Role of Technology vis-a-vis Indian Socio-Legal Framework. Cyber Crimes in the 21st Century*. Manakin Press Pvt. Ltd.

- Shareef, M., Kumar, V., Kumar, U., & Dwivedi, Y. (2011). e-Government Adoption Model (GAM): Differing service maturity levels. *Government Information Quarterly*, 28(1), 17–35. doi:10.1016/j.giq.2010.05.006
- Simtowe, F., Muange, E., Munyua, B., & Diagne, A. (2012). *Technology Awareness and Adoption: The Case of Improved Pigeonpea Varieties in Kenya*. 10.22004/ag.econ.126760
- Solinthone, P., & Rumyantseva, T. (2016). E-Government Implementation. *MATEC Web of Conferences*, 79, 01066. doi:10.1051/mateconf/20167901066
- Transparency International. (2020). *Corruption Perceptions Index, Cyprus*. Available at: <https://www.transparency.org/en/countries/cyprus#>
- Twizeyimana, J., & Andersson, A. (2019). The public value of E-Government – A literature review. *Government Information Quarterly*, 36(2), 167–178. doi:10.1016/j.giq.2019.01.001
- UNDP (The United Nations Development Program-Partnership) for the Future. (2007). *The e-readiness survey for the Northern part of Cyprus*. UNDP.
- United Nations. (2018). *E-Government survey 2018*. Available at: <https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2018>
- Urbina, A., & Abe, N. (2017). Citizen-centric Perspective on the Adoption of E-Government in the Philippines. *The Electronic Journal of E-Government*, 15(2), 63–83.
- Venkatesh, V., Thong, J., Chan, F., & Hu, P. (2016). Managing Citizens' Uncertainty in E-Government Services: The Mediating and Moderating Roles of Transparency and Trust. *Information Systems Research*, 27(1), 87–111. doi:10.1287/isre.2015.0612
- Wolf, C., Joye, D., Smith, T., & Fu, Y. (2016). *The Sage handbook of survey methodology*. doi:10.4135/9781473957893
- Xie, Q., Song, W., Peng, X., & Shabbir, M. (2017). Predictors for e-government adoption: Integrating TAM, TPB, trust and perceived risk. *The Electronic Library*, 35(1), 2–20. doi:10.1108/EL-08-2015-0141

Anil Eyupoglu is a PhD candidate in Management Information Systems field at the Cyprus International University. He received his Bachelor's degree in Software Engineering from The University of Sheffield, UK and further completed Master's degree on Information Technology from Eastern Mediterranean University. He started his professional career as a software developer and he is currently the coordinator of Software Team in Cyprus International University. His professional interests are 'risk management', 'e-government', 'social-media', 'IT management', and 'MVC based web development'.

Tugberk Kaya is an assistant professor in the Department of Management Information Systems at Cyprus International University. He is a member of the board of e-government management committee which works under the prime ministry. Kaya is also a fellow at the Institute for Research in Economic and Fiscal Issues. His professional interests are 'e-government', 'knowledge management', 'social media' and 'process innovation'.