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**INTRODUCTION OF AN E-VOTING SYSTEM IN AZERBAIJAN: READINESS OF
CITIZENS AND GOVERNMENT.**

MA thesis

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Author's declaration of originality

I certify authorship of this thesis. Proper reference has been given to all utilized materials, literature references, and external contributions. The thesis has not been previously submitted for examination.

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Abstract

Citizen-centric public services are currently a popular subject of discussion. E-voting services are increasingly popular. However, academic research has given relatively little attention to this phenomenon due to its recent emergence in Azerbaijan. The issue of citizens' and government readiness to accept such services remains unexplored in Azerbaijan. Government and citizens' acceptance is crucial for the successful implementation of personalized public service provision. This thesis investigates government and citizens' readiness for e-voting services. This study seeks to establish the preparedness of government and citizens for e-voting services and determine the primary factors that affect it. The author queries whether Azerbaijan's citizens and government are prepared for the implementation of an electronic voting system. When it comes to the readiness of Azerbaijani citizens for electronic voting, it is approached from the perspective of their level of technological readiness and trust in electronic services. In the context of the Azerbaijani government's readiness, legal, political, and IT infrastructure readiness issues were considered. A comprehensive analysis of literature on technology, politics, legal, social, infrastructure preparedness was conducted. The author employed a qualitative research method by administering interviews to collect data. The interviews yielded valuable insights towards achieving the objective of the master thesis and addressing the research question.

Based on the analysis conducted on the basis of the research work, it was determined that the citizens and the government of Azerbaijan are partially ready for electronic voting. There is a need for a more thorough analysis of the readiness of Azerbaijani citizens for the social perspective. There is also a problem with the readiness of the government in the political context and serious reforms are needed in this area.

This thesis comprises 63 pages, encompassing 5 chapters, 2 figures, and 4 tables.

1. Introduction

This study will comprehensively analyze the issue of Azerbaijan's readiness to adopt e-voting services from both the citizen and government perspectives. The aim of the study is to assess the existing conditions for the implementation of an e-voting system in the country and to identify the challenges and opportunities for the successful integration of this technology within the governance mechanism of the country. Notwithstanding the establishment of a digitalization policy across various sectors in Azerbaijan, the absence of substantial electronification initiatives within the political sphere, coupled with a dearth of targeted research on electronic voting and a lack of academic discourse on the subject, underscores the imperative to investigate this topic further. Conversely, it is important to note that as of now, 19% of countries worldwide have implemented electronic voting, while an additional 15% are engaged in trials and research regarding the potential adoption of electronic voting in forthcoming elections (IDEA, 2023). This underscores the necessity for an extensive public and academic discourse on the subject within Azerbaijan.

The topic is examined from both technical and social perspectives, with a particular emphasis on the perspective of the citizen. From a technical standpoint, the evaluation aims to determine whether citizens possess the necessary technical resources to participate in and facilitate the e-voting process. This encompasses the level of ownership of digital devices (such as smartphones and computers) and the fundamental knowledge and skills necessary to operate the technology, as well as a citizen's access to the Internet. The social dimension investigates the general comprehension of e-voting technology, the trust that citizens have in it, and their attitudes toward its technical aspects.

The analysis of government readiness will approach the issue from the perspectives of legal, political and IT infrastructure readiness. Within the framework of legal readiness, e-voting, gaps in electoral legislation, and compliance with international standards on the right to vote will be considered. The political readiness will identify the political environment that the government needs to adopt this technology and also assess its relationship with public debate. The government's readiness for an electronic voting system will be examined in the context of IT infrastructure and the country's readiness for e-voting will include the current IT infrastructure in the country, future potential and IT cyber security systems. It will also examine the initiatives and reforms undertaken by the government to improve its information technology infrastructure.

The advancements in technological capabilities have led to an expansion of opportunities for governments globally, including Azerbaijan, to provide a range of services to its citizens. The integration of information and communication technologies into everyday life has led to their

widespread use in various spheres, including politics. Azerbaijan has placed an emphasis on incorporating technological innovations into its governance practices and has made significant efforts towards the implementation of electronic public administration. However, one of the areas where progress has yet to be made is in the implementation of e-voting.

In order to effectively adopt a citizen-centric approach in public service delivery, it is crucial to understand and take into account the true needs and desires of the citizens. This requires a comprehensive study and analysis of the citizen's needs and expectations in terms of public services. The characterization and consideration of citizens' true needs is crucial to the successful implementation of the citizen-centric approach in public service delivery (Scholta, Mertens, Kowalkiewicz & Becker, 2019, p-12). As a result, the needs and desires of citizens in terms of public service must be studied and defined in all countries.

Azerbaijan is among the nations that have undertaken substantial initiatives to incorporate technology into its governance framework. The introduction of e-government services, including the "ASAN" system, the e-government portal, and the e-tax portal, has facilitated the streamlining of public service delivery, enhanced transparency and accountability, and encouraged civic engagement (List of all e-services, 2023). Recent initiatives undertaken in Azerbaijan's digitalization policy have enhanced the potential for technology utilization. Notwithstanding the diverse advancements and implementations of technology, the insufficient utilization of technological capabilities within the political domain, particularly concerning the digitalization of the voting process, necessitates a thorough examination of this subject.

As such, scholars have examined the potential benefits and drawbacks of digitalization in politics in Azerbaijan. Some argue that the use of technology in political processes can help to increase citizen engagement and participation, as well as improve the transparency and accountability of the political system (Babayev, 2016). For example, the use of electronic voting could potentially increase voter turnout and reduce electoral fraud. However, others have expressed concerns about the security and privacy of digital political processes in Azerbaijan. There is a risk that the use of technology in the political processes could lead to the manipulation of results or the infringement of citizens' rights to privacy and freedom of expression. (Babayev, 2016)

Overall, the growing use of technology in governance in Azerbaijan presents both opportunities and challenges for the potential digitalization of politics in the country. Further research and careful consideration of the benefits and drawbacks of digital political processes will be needed

to determine the best way to proceed. In light of the dynamic and evolving landscape of public service delivery, it is imperative to continually refine technology acceptance models to align with emerging modes and patterns of public service utilization. This underscores the critical importance of adapting these models to keep pace with the rapidly evolving nature and tools of public service provision and to ensure their continued relevance in facilitating effective and efficient delivery of public services (Sirendi, Mendoza, Barrier, Taveter, and Sterling, 2018, p-214). The application of e-voting in Azerbaijan has previously been in the media spotlight and discussed by some government agencies. According to Rufat Gulmammadov, Director of the Information Center of the Central Election Commission, the solution to legal issues is a key factor for e-voting in Azerbaijan. If e-voting is reflected in the legislation, the organization of e-voting can be solved without any technical problems (Karimova, 2015). More clearly, before the introduction of electronic voting, it is important to make legal arrangements to ensure that Azerbaijan is legally prepared for electronic voting.

Azerbaijan's membership in the Subcommittee on Electronic Voting of the Committee of Ministers of the Council of Europe and the proposal to conduct electronic voting as a pilot project for referendums, municipal and parliamentary elections in 2008 can be considered as one of the initial steps indicating the potential for adopting electronic voting in Azerbaijan. No information was shared regarding the progress of the project in subsequent periods. Also, no information was shared with the public regarding the suspension of the project. Despite the lack of information regarding the project in the following years, according to the Head of the International Relations Department of the CEC, there are signs that an electronic voting pilot project may be implemented in future municipal or parliamentary elections. This indicates the importance of examining the readiness of citizens and the government for the implementation of the electronic voting system in Azerbaijan (Babayeva, 2018). On the other hand, electronic voting has been one of the topics of discussion by state officials, members of the Central Election Committee and MPs in recent times. Alimammad Nuriyev, president of the "Constitution" Research Foundation, noted that the experience of Estonia, which is one of the leading countries in digitalization in the world, is being studied (2020) and specialists from Estonia were invited to promote digitalization in Azerbaijan. He also noted that, based on the experience of other countries, it is possible to provide electronic voting in Azerbaijan very quickly, but before that, it is important to make citizens accustomed to such services (Ahmad, 2020).

With the spread of the coronavirus in Azerbaijan, digitalization of service areas in Azerbaijan became relevant. Like many areas, the application of electronic voting was discussed by state officials on the agenda of Azerbaijan. Chairman of the Economic Policy, Industry and Entrepreneurship

Committee of the Milli Majlis, MP Tahir Mirkishili stated in one of his interviews that electronic voting method can be applied as a pilot project in certain circles in Azerbaijan in the future, but before applying electronic voting, there is a need to create interest in it among citizens and develop it in the direction of information security (Will electronic voting be implemented in Azerbaijan?, 2021). According to Osman Gunduz, president of the Azerbaijan Internet Forum, despite the infrastructure of Azerbaijan allowing the application of electronic voting, security measures and transparency should be ensured. Society should accept that electronic voting is transparent and reliable (Will electronic voting be implemented in Azerbaijan?, 2021).

It is worth highlighting that several Non-Governmental Organizations (NGOs) in Azerbaijan have previously conducted informal, non-binding electronic voting exercises through project websites. This kind of informal e-voting technology test was first carried out during the parliamentary elections in 2010 (Azertag, 2010). The primary aim of this initiative was to conduct research focused on the study and analysis of the practical voting process. It is crucial to emphasize that the outcomes of this e-voting exercise held no legal significance or impact on the official electoral processes; they were exclusively intended for experimental and analytical purposes and were confined to a local context. As part of the study, 25,442 voters used electronic polling, according to the member of the initiative team Rasim Sharifli. The number of votes cast was 43.8 percent, according to coalition monitors in 80 constituencies (Hajiyev, 2010).

In the modern world, activities are being carried out towards the digitalization of many services that are traditionally organized. This, in turn, creates new opportunities and uncertainties, which make it impossible to make specific assumptions about. However, it is possible to minimize inaccuracies by conducting research in this direction. Therefore, it is imperative to study the readiness of Azerbaijani citizens and the government for electronic voting. Although there have been many discussions on the introduction of electronic voting in Azerbaijan's agenda, no serious academic research has been conducted in this direction. Given the lack of extensive research on this topic, the proposed master's thesis will serve as a contribution to the existing literature on electronic voting in Azerbaijan. By examining Azerbaijani attitudes and perceptions towards e-voting, this study will provide information on potential challenges and opportunities associated with the implementation of such a system. The results of this study can also inform policymakers and stakeholders on the necessary measures that need to be taken to ensure the successful implementation of e-voting in Azerbaijan.

2. Literature Review and Theoretical Context

This chapter summarizes the literature review on citizen and government readiness for electronic voting. The literature review used explains the main findings, discussions and gaps related to the topic. Based on the literature review used, a theoretical framework is linked to the findings and the criteria necessary to answer the research question and sub-research questions are identified.

2.1. Literature review

Nowadays, digital technologies have emerged as a dominant factor in political affairs, serving as a medium to disseminate information and as a platform for election campaigns. Additionally, the emergence of these technologies has created a more transparent political space, promoting greater accountability and enhanced responsiveness to citizens' needs and demands (Neudert and Marchal 2019, p-23). Azerbaijan is one of the countries that have expressed an interest in implementing a digital system to increase the accessibility and convenience of the governmental system. However, the successful implementation of such a system is not only dependent on the availability of technology but also on the readiness of citizens to adopt it. Currently, 455 electronic forms of government services are provided to citizens in Azerbaijan, and this list is growing (List of all e-services, 2023). The speed and wide diversification of digitalization in Azerbaijan makes it important to study the potential application of digitalization in voting and the readiness of citizens to accept it.

Understanding citizens' readiness for e-voting is essential for ensuring the successful implementation of such a system (Fouad, 2016, p-10). By examining existing literature in detail, this section aims to provide a comprehensive assessment of the readiness of citizens in Azerbaijan for the potential implementation of an electronic voting technology. In addition to recommending future studies in this field, the review will point out any holes in the current literature. To do so, the following subsections are aimed to explore and discuss existing research relevant to this study. The review will delve into various factors, including technological, social, political, legal, and IT infrastructure aspects that may impact the level of readiness of citizens to embrace e-voting technology and readiness of the government to implement such a technology.

First, the literature on the concept of electronic voting is discussed in order to understand the definition and theoretical background of the general topic, providing a foundational understanding of the key principles and mechanisms involved in e-voting systems. Discussing the concept of e-voting is essential for establishing a clear and shared understanding of the technology's core principles and mechanisms. By exploring the definition and theoretical background of e-voting, the literature review provides a foundation for assessing the potential benefits, challenges, and implications of adopting

such a system. This foundational knowledge enables a more informed evaluation of the subsequent sections of the literature review focusing on the experience of other countries, citizens' readiness to use technology and the government's readiness to implement technology. Next, the author delves into the experiences of various countries that have implemented e-voting systems, providing a comparative analysis of their practices and outcomes. Overall, the subsection covers and summarizes examples from various different countries - both successful and failed attempts. By examining the successes and challenges faced by these nations, the analysis aims to derive valuable insights that can inform the potential adoption of e-voting in Azerbaijan within this study.

Moving forward, the preparedness for electronic voting from both the perspectives of citizens and government entities is discussed. When examining the subject from the perspective of the citizen, the foundation is established upon technological and social preparedness. In the subsection focused on citizens' readiness to accept and use technology, the author focuses on existing scientific theoretical frameworks regarding technology adoption, particularly Technology Acceptance Model and its extensions. Later, from the perspective of the government, particular emphasis is placed on the research conducted regarding legal, political, and information technology infrastructure components.

2.1.1. Concepts of Electronic Government and Electronic Voting

The development of technological capabilities has been accelerated in recent years, resulting in an increase in the ability of governments to provide services to their citizens. The emergence of high-speed information and communication technology has presented new opportunities for both the private and public sectors to deliver services. Public service delivery, in particular, has undergone significant changes as more governments adopt a citizen-centered or human-oriented approach. The implementation of a citizen-centered approach in public service delivery requires a comprehensive understanding of the real needs of citizens, which are often diverse and complex (OECD, 2019, p27-28). Therefore, it is critical to identify and prioritize the real needs of citizens in order to achieve successful outcomes in public service delivery. This approach emphasizes a people-centered service delivery mechanism that not only improves citizen satisfaction but also enhances the overall quality of life. Furthermore, this trend towards citizen-centered service delivery has resulted in a shift in the role of the government from being a service provider to being an enabler of services, allowing citizens to access a broad range of services more easily and efficiently (OECD, 2019, p-27-28).

The advent of digital technologies has revolutionized the way governments provide services to their citizens. The provision of e-government services is accelerating day by day. Yet, it is hard to

propose a single definition of e-government as there are various perspectives on this. For example, The World Bank describes e-government as the utilization of information and communication technologies (ICT), like mobile computing and the Internet, by government agencies to transform their interactions with citizens, businesses, and other government entities. (e-Government, 2015; Othman & Razali, 2013; 2012; Alghamdi, Goodwin, & Rampersad, 2011). Other researchers (Zhang & Hou, 2011) define e-government as the adoption of information technology, especially the Internet, by governments to improve their operations, increase citizen engagement, and deliver services. However, what is central to varying definitions of e-government is that its implementation means greater ease of use of governmental services for citizens, improved governmental service delivery, simplified compliance with governmental laws for citizens, increased citizen engagement and trust in government, decreased fraud, and improved government cost efficiency (What is e-Government and why it is important?, 2019).

For the purposes of the current research, “e-government” refers to the utilization of digital technologies to deliver public services and communicate with citizens, which cover various aspects of government operations, including but not limited to administrative procedures, public information provision, social security, healthcare, education, and taxation. In addition to these administrative and social functions, e-government also encompasses political activities that aim to enhance democratic participation, such as e-voting. Electronic voting is considered as a subcategory of e-government services that allows citizens to cast their votes electronically through online platforms or other digital channels and count votes in political elections and referendums (Taiwo, 2015, p2980). According to the World Economic Forum, historically, e-voting started with usage of technological devices at polling stations, yet currently this concept is better known associated with “remote” voting capabilities and opportunities (The World Economic Forum, 2024). From the point of view of the voter, there are two main parts to knowing the possible problems and best practices with electronic voting (European Commission, 2023). The first element involves the loss of physicality of paper ballots and their replacement by electronic ballots, which potentially affects some or all voters, and can be implemented voluntarily or involuntarily. Electronic voting machines offer voters a more convenient and technologically superior way to vote. Unlike traditional paper ballots, electronic voting machines record voters’ choices directly in digital form, making the electoral process faster, more accurate and efficient (Hoque, 2014). The second component is the possibility of voting remotely, either geographically or temporally. This means that people should be able to vote outside of their usual polling places or before regular voting days (Stenbro, 2010; European Commission, 2023). Other

researchers also highlight the difference between the use of electronic devices to assist the voting process and remote voting using internet capabilities (Maaten, 2004; Lust 2018).

For the purposes of this research, "e-voting" will be examined specifically through the lens of "remote voting." This focus is crucial because the challenges and benefits of e-voting can vary significantly depending on whether voting occurs remotely or at traditional polling stations. By distinguishing between these perspectives, the research aims to provide a more nuanced understanding of the implications of e-voting technologies. Remote electronic voting, where eligible voters can cast their ballots from anywhere in the world on their own devices, is one of the most striking examples of the integration of modern technology into the electoral process (Merino, 2023). Remote electronic voting is regarded as an optimal solution, particularly for individuals who are unable to attend polling stations in person. This method promises to increase voter turnout, improve the accessibility of the electoral process, and reduce organizational costs (Bruter & Harrison, 2017); European Commission, 2023; Maaten, 2004; The World Economic Forum, 2024).

While e-government services have been implemented in many countries to improve public service delivery and governance, the deployment of e-voting is still in its infancy. Estonia and Switzerland could be considered as one of the forerunners in e-voting where discussions on the usage of electronic means for voting started as early as in 2001 and later implemented in 2005 (Maaten, 2004; Alvarez, Hall, & Trechsel, 2009; Solvak & Vassil, 2016; Lust 2018; Ehin, Solvak, Willemson, Vinkel, 2022). While both - e-government services and e-voting systems - aim to leverage technology to enhance public services and engagement, the specific nature of e-voting requires a more nuanced approach due to the potential influence on the electoral and democratic processes. Although the majority of research provides a positive perspective on the benefits and usability of, it is worth mentioning that some researchers have totally opposing views on e-voting. For instance, Appel (2023) suggests that internet voting is inherently insecure and cannot be made safe, despite its convenience and accessibility benefits. Further, Appel (2023) discusses legal and policy controversies, noting that while some uses of the internet in voting processes are appropriate, the transmission of voted ballots via the internet remains a significant security risk. There are also significant technical concerns related to security, privacy, accuracy, and trust of such systems, which need to be carefully addressed to ensure the integrity and legitimacy of elections.

However, the current practices of various countries offer valuable insights into the potential future developments of remote e-voting (Darmawan, 2021; International Institute for Democracy and

Electoral Assistance, 2011; European Commission, 2023; Risnanto, 2019; Ismail, 2008; Hailu, 2020). By examining the experiences and implementations in different nations, we can better understand the challenges and opportunities associated with this technology. For instance, Estonia's early adoption and continued use of e-voting provide a rich case study on the feasibility and impact of such systems (Slovak & Vassil, 2016; Alvarez, Hall, & Trechsel, 2009; European Commission, 2023; Maaten, 2004). These insights can help inform the development of more secure, reliable, and user-friendly e-voting platforms in the future. Therefore, further the literature review puts emphasis on experience and practice of various countries.

2.1.2. Electronic Voting Practice: A Comparative Analysis of International Experience

Researchers from various countries as well as different institutions have conducted a comprehensive review of academic literature on e-voting readiness across multiple countries and compiled and presented the resulting general perspectives (Risnanto, 2019, p-3; Darmawan, 2021; International Institute for Democracy and Electoral Assistance, 2011; European Commission, 2023; Ismail, 2008; Hailu, 2020). This synthesis of research offers valuable insights into the readiness and challenges associated with implementing e-voting in diverse contexts. This approach is intended to provide a broad overview of the common considerations and prerequisites necessary for successful e-voting implementation within different contexts.

According to Aljarrah (2016, p-862), the groundwork for the implementation of electronic voting can be categorized into three fundamental theories. These theories are trust, the diffusion of innovation, and the technology acceptance model. The next subsection delves into these theories in-depth, yet the following brief descriptions are provided to facilitate further discussion in this section (2.2) on the comparative analysis of other countries' experiences. In the context of trust, it is essential to establish trust on the internet and the government to ensure successful implementation of electronic voting. Concerning the diffusion of innovation, it is necessary to consider the compatibility and relative advantage of electronic voting. Finally, the technology acceptance model emphasizes the perceived usefulness and ease of use of electronic voting, which are crucial factors in its successful implementation (Aljarrah, Elrehail and Aababneh, 2016, p 864-65).

It is crucial to begin by looking at Estonia as an example, a country that is well-known for having effectively implemented technology in government, including for electoral purposes. Scholars and practitioners have studied Estonia in great detail as a pioneer in online voting. For instance, earlier researchers (Maaten, 2004) and (Drechsler & Madise, 2004) discussed foundations of electronic

voting in Estonia and later, building on first experiences, other authors like (Trechsel, Schwerdt, Breuer, Alvarez & Hall, 2007) and (R. Krimmer and R. Schuster, 2008) found that Estonia's success has been largely attributed to a number of factors, including a robust legal and regulatory framework, a well-developed technology infrastructure, and a high level of public trust and acceptance. Further, researchers have conducted extensive research based on the years of internet voting experience of Estonia (Solvak & Vassil, 2016; Ehin, Solvak, Willemsen, Vinkel, 2022). Latest research findings show that “the rapid uptake and burgeoning usage rates reflect the system’s embeddedness in a highly developed digital state and society” (Ehin, Solvak, Willemsen, Vinkel, 2022). Large knowledge and data accumulated as a result of implementation in Estonia over years also established Estonia as a guiding lighthouse and therefore enable comparative studies to assess readiness of other countries (Lust, 2018; Mpekoa & Van Greunen, 2017; Aghabayli, 2023; European Commission, 2023, etc.).

For instance, (Lust, 2018) investigated the impact of internet voting in Estonia and certain cantons of Switzerland and came to conclusions that internet voting results in certain political shifts in the case Estonia, yet the same did not happen in the case of Switzerland. Another study was conducted by (Mpekoa & Van Greunen, 2017) on comparative analysis of the cases of Namibia and Estonia, where the researcher’s performed comparison of the electronic voting systems used in both of these countries, examining the factors that have contributed to Estonia's success with electronic voting while also emphasizing Namibia's difficulties in adopting electronic voting. According to the aforementioned authors, governments thinking about implementing remote electronic voting should focus on evaluating their technological resources and infrastructure, interact with stakeholders to foster system support, and make sure that sufficient security measures are in place to guard against election fraud (Mpekoa & Van Greunen, 2017).

Various researchers (Ehin, Solvak, Willemsen, Vinkel, 2022; Avgerou, 2013) suggested that trust is a critical factor in the successful implementation of e-voting systems and Avgerou stated the emphasized the importance of trust in Brazil, and he noted that it is affected by a variety of social, political, and technological factors (2013). The subject of e-voting readiness was also studied in the case of Nigeria, and the study discovered that while there is widespread support for e-voting in Nigeria, there are significant challenges that must be addressed in order to successfully implement e-voting systems. A lack of technological infrastructure and expertise, legal and regulatory barriers, and general skepticism about the reliability and security of e-voting systems are among the challenges (Adeshina and Ojo, 2017). According to Manik Hapsara (2013), an Indonesian safety-critical systems model for e-voting contains a comprehensive framework for ensuring the security and reliability of e-

voting systems. The study also analyzes Indonesia's legal and regulatory frameworks for e-voting and identifies key challenges to e-voting system implementation, such as a lack of technological infrastructure, limited resources, and public skepticism about the reliability and security of e-voting systems (Manik, 2013, p303-304).

When it comes to developed countries, there have been several initiatives to embed internet voting into the electoral process at various levels. To start, Switzerland presents a unique experience in terms of enabling its citizens to vote online. Unlike the other discussed countries (e.g., Estonia), implementation of internet voting in Switzerland has been organized step-by-step on a canton-by-canton approach. It means that different cantons (districts) have implemented internet voting at varying times (Lust 2018; Borucki & Hartleb, 2023). However, it is noteworthy to add that Switzerland can be considered a rather specific case due to two more unique facts: it is a federative country with a direct democracy - which means that citizens get an opportunity to vote comparatively more frequently than other countries. As a result of comparatively frequent use of internet voting, there have been a large number of scientific studies on the experience of Switzerland in this field. In turn, it contributed to the advancement of research.

Overall, the existing evidence indicates that internet voting in Switzerland has primarily been used by young, educated, and affluent individuals, particularly males aged 18 to 49 (Serdult, Germann, Mendez, Portenier and Wellig, 2015). However, these sociodemographic factors are not what make people vote online. What makes people vote online is how often they use the internet and how much they trust online transactions. This means that the digital divide in online voting could narrow over time as technology becomes easier to access and more common (Serdult, Germann, Mendez, Portenier and Wellig, 2015). Also, study that has already been done gives us some interesting information about the social and demographic characteristics of internet voters in the Swiss internet voting pilots. This information is shown in Table 1.

Study	Target group	Results
Christin and Trechsel, 2005	Residents of Geneva	Bivariate analyses indicate that the online voting channel was used more by younger (30-39, 40-49, and 18-29), male voters with high education and relatively high household income. In a multivariate model, only age and education remain significant. Yet, when ICT variables are included, only these ICT variables remain significant predictors of internet voting.

Serdult and Trechsel, 2006	Residents of Zurich	Bivariate analyses suggest that voters between 40-49 are the most frequent users of internet voting, followed by voters between 18-39. Male voters, voters with high education and voters living in high-income households are also overrepresented among internet voters.
Serdult, 2010	Expatriates residing in Geneva	Based on bivariate analysis the 30-39 year old voters most often choose the internet voting channel, followed by the 40-49 and the 18-29 year old cohort. Men are also slightly overrepresented among internet voters.
Sciarini et al., 2011	Residents of Geneva	Bivariate analyses again shows that voters aged 25 to 34, males, and those with high education and income are the most frequent users of the internet voting channels. In a multivariate model, these variables remain significant (note: income could not be included in these models), but adding ICT variables makes the socio-demographic factors insignificant..
Germann et al., 2014 & Germann and Serdult, 2014	Expatriates registered in Argovia, Basel-City, Grisons and St. Gallen.	Both studies, focusing on the 2011 federal elections and based on the same data, found that, similar to previous research, males were overrepresented among internet voters, with no differences in age or education. Still, the studies' empirical basis, a self-selected sample of expatriates, is relatively weak.
Lust, 2018	General	The research also finds that electronic (internet) voting in Switzerland is generally demographically biased in favor of young, male, and college-educated voters. Still, the bias has not affected electoral outcomes because it has not increased overall voter turnout. The results suggest that while internet voting may offer convenience and accessibility to particular groups, it has not yet led to a significant expansion among a wider voter base or a considerable shift in electoral results.

Table 1. Summary of research examining socio-demographic characteristics of internet voters in Swiss internet voting trials. Source (Serdult, Germann, Mendez, Portenier and Wellig, 2015). Edited and extended by the Author.

Despite successful examples of Estonia and Switzerland, there have also been failed attempts and cases to introduce electronic voting via the internet in the other European countries. For instance, certain developed countries have faced challenges and decided not to proceed with internet voting

(Risnanto, Rahim, Herman and Abdurrohman, 2020). A pattern shows that trust and security was one of the main issues reported. Below table summarizes the challenges faced by different countries.

Country	Highlight of key challenges
Netherlands	Public mistrust of e-voting
United Kingdom	The Government and other interest groups questioned the trust and security
United States	Majority of voters preferred traditional paper-based voting which led to cost-benefit questions. Additionally, trust and security was questioned.
Norway	Security and integrity of votes were challenged by the voters. Technical issues amplified the above concerns further (e.g. it was reported that certain voters were able to vote repetitively).

Table 2. Overview of challenges faced by developed countries. Source (Risnanto, Rahim, Herman and Abdurrohman, 2020). Edited by the Author.

Overall, the existing research on practice of implementation of electronic voting as well as studies discussing potential implementation of such technologies in other countries provide valuable insights into current master theses. Literature review on these cases has enabled the author to get a holistic view of existing evidence on the factors possibly affecting introduction of remote electronic voting technologies. The results of literature review further enable discussion of particular determinants of successful application of advanced technologies in the electoral process. Upcoming subsection discusses these factors and determinants in-depth: first, starting with citizens' readiness for technology use (with a focus on electronic voting) and, second, government's readiness to implement remote electronic voting technologies.

2.1.3. Citizens' readiness for technology use

Public services are critical in modern communities because they provide vital infrastructure, utilities, and support to citizens. Nevertheless, simply providing such services is insufficient to ensure that citizens use them effectively. The successful adoption of these services by citizens necessitates some level of preparation on their part. Citizens' preparedness to embrace and use public services can be influenced by a variety of factors, such as their level of education, socioeconomic status, cultural beliefs, and prior experience with similar services (Ismail, 2008). It is essential to acknowledge the significance of citizens' readiness to adopt public services, as this can have a substantial impact on the

success of public service delivery. Citizens' lack of preparedness can lead to poor utilization of public services, resulting in inefficiencies and resource waste. As a result, the process of providing public services should include measures to assess citizens' preparation and correct any gaps in their preparedness.

The success of public services is based not just on their effectiveness, but also on residents' willingness to use them (Nasution, Rusnandi, Qodariah, 2018, p-98). The idea of accepting a service or technology is fundamental to research on technology adoption. Understanding the elements that determine citizens' preparedness and putting methods in place to increase it can lead to more efficient and effective use of public services, benefiting both citizens and society as a whole. According to earlier research, many factors such as perceived ease of use, perceived usefulness, attitude toward technology, trust, social influence, and conducive conditions influence readiness to embrace a specific service. As a result, it is critical to explore the elements that motivate people to use e-voting, a relatively new and novel technology in the field of democratic processes (Albuquerque, Baptista, and Fernando, 2016, p-589).

Therefore, the current subsection focuses on research relevant to assessment of end users' readiness to use technological innovations in the public sector services. For these purposes, the authors have identified existing research related to technology adoption and acceptance. The author selected a number of important theories with a particular focus on technology which are discussed below. First of all, it is important to note that an extensive amount of research has been done in order to analyse and identify the question of users' readiness for new technology and innovations. As a result of literature review, the author has identified three main types of existing research on technology readiness and acceptance:

- 1. Foundational theories.** The foundational theories that direct research in a particular field are formed by grounding theories and models. The conceptual foundation for comprehending phenomena, developing hypotheses, and planning research is provided by these theories.
- 2. Extensions.** By adding new variables or constructs, extension models expand on the aforementioned foundational theories that already exist. By taking into consideration other variables that could affect the phenomenon being studied, the original theory's explanatory power is intended to be increased.

3. Replications. Through their application in various contexts, replication models apply the foundational and extensional theories in order to evaluate the generalizability and robustness of grounding theories. Another aim for this type of research is to use theories in practice and test certain technological innovations. This entails reproducing the methodology of the original study in various contexts to determine whether the results are consistent.

Starting with foundational theories, one of key works in this field is the Technology Acceptance Model (TAM) developed by Fred D. Davis (1986) as part of the researcher's PhD thesis. This model is based on the Theory of Reasoned Action (TRA) developed by Ajzen and Fishbein in 1980, however the author doesn't provide an in-depth review of preceding research considering the scope limitation of the current master thesis. The research centers on the practical application of technology and seeks to discover how users perceive and adopt new technology. It employs a model that evaluates the user's mindset toward information systems, which comprises two major factors: perceived usefulness and perceived ease of use (Davis, 1986). These factors eventually formulate the users' intention to use a particular service or technology.

In his first model, Davis incorporated the concept of "Attitude Toward Using" technology in, but did not include "Behavioral Intention," arguing that in the context of user acceptance, measurements of subjects' motivation to use a new system would occur right after demonstrating the system. As a result, the researcher claimed that the time needed to form an intention would not have occurred prior to actual measurement (Davis, 1986). Later on, the model was refined further, and "intention to use" was introduced to the TAM. The authors regarded "Intention to use" as the primary variable mediating the effects of "Perceived Usefulness" and "Ease of Use" on the "Usage behavior" (Venkatesh. V and Davis. F, 2000; Davis, 1989).

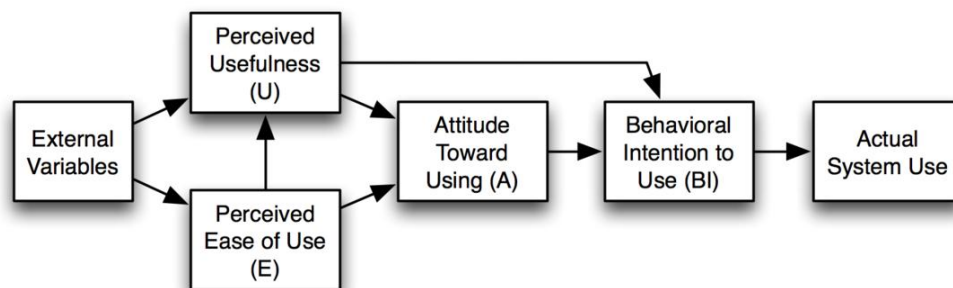


Figure 1. Updated Technology Acceptance Model. Source (Davis, 1989).

Later, the Technology Acceptance Model (TAM) was developed further beyond the addition of an intention to use variables. For instance, the researchers also added certain new factors that influence the variables in the updated model, as shown in Figure 1 (Venkatesh and Davis, 2000).

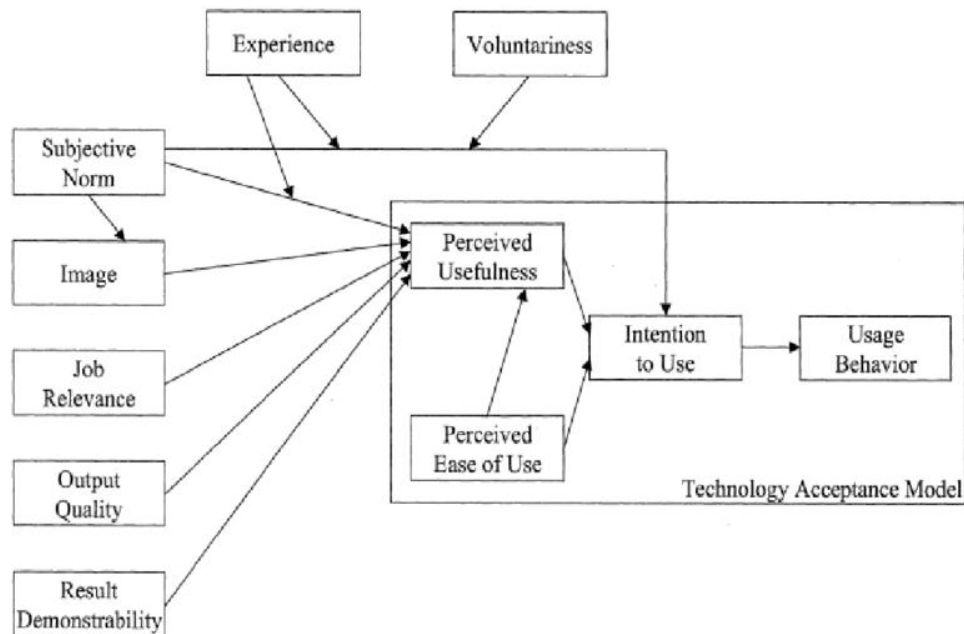


Figure 2. Extension of the Technology Acceptance Model by Venkatesh and Davis, 2000

The Technology Acceptance paradigm (TAM) is not the only paradigm that explains technology adoption. The Unified Theory of Acceptance and Use of Technology (UTAUT), developed in 2016, suggests several factors that influence technological acceptance (Venkatesh, Thong and Xu, 2016, p-329). According to the UTAUT, variables such as success expectancy, effort expectancy, social influence, and facilitating conditions all influence technology adoption.

Additionally, Venkatesh proposed the idea of "Facilitating Conditions," which refers to the degree to which individuals perceive the existence of an organizational and technical infrastructure that facilitates the utilization of a system (Venkatesh, Morris, Davis, and Davis, 2003, p-431). This term refers to the necessary conditions that must be in place to enable individuals to use a system with ease and efficiency, without encountering any obstacles or barriers. According to Ajzen's "Facilitating Conditions" framework, for users to adopt and successfully use technology, they must have both ownership and capability of the technology resource (Ajzen, 1991, p-186). Technology ownership refers to the possession of the device or equipment needed to use the technology, whereas technology ability refers to the skills and knowledge required to operate the device or equipment.

According to international measurements, there is an index which is called the Network Readiness Index (NRI) is a composite index that measures the degree to which countries are prepared to leverage information and communication technologies (ICTs) for social and economic development (Laskaridis, Markellos, Markellou, Panayiotaki, Tsakalidis, 2008, p-191). The NRI takes into account a range of factors, such as infrastructure, digital skills, and the social and economic impact of ICTs, to provide a comprehensive assessment of a country's technological readiness. NRI could be one of the reasonable indexes in the case of measurement of technology readiness.

In the context of electronic voting, societal preparedness alludes to residents' faith and confidence in the electronic voting system (Krimmer and Schuster, 2008). Residents' understanding and trust in electronic voting techniques were also cited as indicators of e-voting preparedness at the Fifth International Joint Conference on Electronic Voting. (Duenas-Cid, Krivonosova, Serrano, Freire, & Krimmer, 2020, p-70). Citizens' intentions to use state e-services may be influenced by their perceptions of trustworthiness. Bélanger defines trustworthiness as the impression of confidence in the dependability and purity of the electronic advertiser (Bélanger, Hiller, & Smith, 2002, p-246). Citizens must have faith in both the government and the tools that enable it. Papa Arkhurst (2005) provided an example from the Hart-Teeter national poll in his paper, where it was discovered that while Americans acknowledge the potential of e-government to improve government functioning, they are hesitant to share personal information over the internet (Arkhurst, 2005, p-16). This is due to their concern that their data will be abused, and their privacy will be jeopardized. It implies that trust is a critical element in adopting e-services. Citizens' confidence in government institutions could be recognized as an aspect of their trust in e-voting systems. According to research, citizens who believe state institutions are more apt to trust e-voting methods. This is because e-voting methods are frequently installed and managed by the government or other state organizations (Leets, 2021, p387-388). As a consequence, faith in these organizations can be extended to e-voting systems, resulting in greater trust in these systems among citizens. Furthermore, the technology confidence factor appears to be extremely dependent on citizens' trust in e-voting techniques (Leets, 2021, p388). This is because e-voting systems are complicated technologies that every individual does not entirely comprehend.

Citizens' ease of use of computerized voting (e-voting) systems has been recognized as a critical element in these systems' effectiveness in supporting elections (Krimmer, 2012). The social dimension of e-voting alludes to the possible effect of these mechanisms on citizens' electoral involvement, political engagement, and general confidence and legitimacy of democratic organizations. In this context, it has been discovered that the usability of e-voting systems is an

essential determinant of their societal effect. The primary goal of e-voting systems is to simplify elections, and the system that must be created has to protect the privacy of the voter while also being readily understood and used by the complete voting population - regardless of who they are or where they originate from (Ofori-Dwumfuo and Paatey, 2011, p-92).

Typically, the lack of success in adopting technology can be attributed to a narrow focus by the developers on the technological aspects, while neglecting the social factors relevant to users such as cultural practices and behavioral patterns. This is particularly evident in the deployment of electronic voting systems, where numerous nations have struggled to gain public trust due to concerns over the suitability of the technology or skepticism towards its reliability within the local context (Risnanto, Rahim, Herman and Abdurrohman, 2020, p3288). Citizens' trust in technology and their ability to comprehend its technical features are important factors in its success. According to Krimmer (2012), in order to use the system effectively and confidently, voters must have a basic grasp of electronic voting technology. This is due to the fact that technical complexities and a lack of comprehension can cause confusion, mistrust, and poor voter turnout. Building citizens' confidence and understanding of electronic voting technology is thus an important component of social preparation for effective e-voting implementation.

2.1.4. Government's readiness for technology implementation

As already discussed, remote electronic voting has evolved and currently is being discussed as an extension to support the conventional paper voting methods as the world has gone digital. Especially after the recent years COVID pandemic, these debates on internet voting increased. Electronic voting has the ability to increase voting efficiency and accessibility while decreasing the risk of mistakes and fraud. While the implementation of electronic voting might seem appealing, it is critical to guarantee the existence of a suitable setting in order for it to be effective. In order to implement electronic voting, legal, political, societal, and technical factors should be taken into account (Alexander, Vasyl and Frederico, 2016, p-7). Investigating the factors influencing the creation of suitable conditions recommended for preparing for the introduction of electronic voting is one of the important components for achieving the goal of the master's work. According to Baeuo et al. (2016), readiness of e-government is an extensive topic and “can be seen as the preparedness of a country to develop and adopt e-government in terms of its technology infrastructure, development of human resources, as well as telecommunication infrastructure.”

To discuss the introduction of electronic voting, it is critical to keep to the legal regulations guiding electronic voting design (Lisa, Mohamad and Utami, 2022, p-294). In an ideal world, electronic voting would be followed by a thorough law reform or review process that considers the possible ramifications and results of this technical evaluation (Wolf, Nackerdien and Tuccinardi, 2011). The legal structure should be created with careful consideration for the findings and results of the trials, ensuring that the computerized voting process is not only practically viable but also legally sound and safe. The technological criteria for hardware and software building and operation should guarantee the technical security, usability, and interoperability of e-voting systems (Mitrou, 2004). According to the European Parliament, the legal analysis should concentrate on the effect of Internet voting on election law's fundamental principles of universal, equitable, free, private, and direct voting (Alexander, Vasyl and Frederico, 2016).

According to Krimmer and Schuster, the fundamentals of democratic elections such as the election system and human rights that are required by a democracy are important from a legal perspective (2008). In short, the transparency of the electoral system and the absence of restrictions can be considered a desirable environment for electronic voting. In the framework of legal preparation, Krimmer and Schuster (2008) considered markers such as election regularity, vote weight, direct voting rights, election secrecy, election fraud protection, and postal and advanced voting. Indirectly, all indicators point to the voter's unhindered use of his right to vote and the validity of this vote. In essence, the principles of human rights and democratic elections are paramount within this context. The legal framework is a critical component of the field of law, and electoral law, in particular, forms the foundation for the technological solution. In the context of electronic voting, the established legal tenets governing elections hold significant relevance, alongside the manner in which electronic voting is introduced and integrated into the legislative landscape (Prosser and Krimmer, 2004, p-25).

The security of the legal framework for electronic voting is critical for establishing trust and confidence in citizens, which is required to maintain the integrity and legitimacy of the election process (Bryan and Dan, 2013). The existence of the legal framework of the system is characterized by its precise and operational functioning, ensuring understandable and transparent procedures, protecting voter anonymity, being accessible to everyone, and complying with all requirements of the legislation (Bryan and Dan, 2013).

Mekuria contends that the integrity of political decision-making is essential to the credibility of democracy itself and that any system created for elections must be able to withstand any assault,

be accepted by the electorate, and allow for the uncontested declaration of the election results (Hailu, 2020). In the study published in Indonesia, the importance of political factors in electronic voting and the readiness of political factors for the successful application of electronic voting were emphasized (Lisa, Mohamad and Utami, 2022, p-296). The political context of a country was examined by measuring subdimensions such as institutional stability, type of government, political participation, voter turnout, political goals, and so on (Krimmer and Schuster, 2008). Institutional stability and type of governance can be described as the initial environment for the introduction of electronic voting. The importance of these two elements plays a key role in the organization of the electronic environment. However, there are some points that are important for a country's preparation for electronic voting from a political point of view. From the standpoint of the country, political participation is one of the most essential elements of political preparedness, which usually refers to citizens' participation in actions that affect the political process (Deth, 2021). It is a fair assumption that citizens' level of political involvement reflects their level of political concern. A study conducted in Indonesia highlighted the relationship between political interest and electronic voting (Hapsara, Imran and Turner, 2017, p-366).

Considering that electronic voting is primarily aimed at promoting democratic elections by creating a transparent electoral system, it is important that citizens have the autonomy to vote for their preferred candidate without any external pressure or interference. As we approach preparation for e-voting from a citizen's perspective, it is important to know how citizens feel they are able to exercise their voting rights independently. Citizens must be able to think critically and make informed choices based on their own personal principles and beliefs, rather than being swayed by external influences or pressures (Paul, Richard, Michael and Peter, 2008, p-586). It is imperative to engage in extensive public discourse regarding the implementation of electronic voting systems to evaluate the perspectives and acceptability of both the population and governmental entities towards this technology. These discussions establish an environment conducive to examining public perspectives, preemptively identifying potential challenges and obstacles, and enhancing confidence in the electoral process. This approach is essential to guarantee that technological innovations are not only compliant with legal and technical standards but also serve the interests of society (Vladislav, 2021).

Electronic voting systems aim to make the electoral process more flexible, transparent and accessible to citizens by taking advantage of modern technologies. Such systems not only facilitate the effective implementation of democratic principles, but also facilitate citizens' participation in the voting process. However, the country's information technology (IT) infrastructure plays a crucial role

in the successful implementation of this technology. Without a strong and secure IT infrastructure, e-voting cannot be effective and reliable (Krimmer and Schuster, 2008). Various researchers highlighted the gap in existing research regarding technological readiness of governments to implement and introduce technological innovations in the public sector (Dzhusupova et al., 2010; Baeuo et al., 2016; Sirait et al., 2024). In international practice, there are many indices used to measure countries' adoption of electronic services, and one of them is the e-government development index (United Nations, 2012). The e-government development index is determined based on the ability and willingness of the government to provide online services and communicate with its citizens electronically, the existing IT infrastructure, and the ability of citizens to use e-government services (United Nations, 2012). The Global Innovation Index can be considered one of the important indices in determining a country's readiness for e-voting at the government level. The Global Innovation Index helps track countries' developments and consists of about 80 indicators in total (Leogrande, 2024). According to Global Innovation Index, it evaluates innovation based on characteristics such as institutions, human capital and research, infrastructure, credit, investment, linkages; the creation, absorption, and dissemination of information; and creative outputs (Leogrande, 2024).

For e-voting to be successful, it is essential that a country has a modern and resilient network infrastructure. Unauthorized access to networks facilitates surveillance and intelligence gathering, while also presenting opportunities for malicious cyberattacks (Election Infrastructure Cyber Risk Assessment, 2020). This infrastructure should include a high-speed internet network that covers not only major cities but also the most remote settlements of the country (National Democratic Institute, 2013). Internet connectivity can contribute to expanding democratic participation by enabling voters to vote from any location.

Cybersecurity is one of the most critical aspects of electronic voting systems. The confidentiality of voter data, the completeness of voting results, and the integrity of the system must be protected from any cyberattack. This requires the use of advanced security technologies such as encryption algorithms, multi-factor authentication, firewalls, and real-time monitoring systems (Stenbro, 2010). The Global Cybersecurity Index is used to measure countries' cybersecurity preparedness at the global level, and the index is based on criteria such as legal, technical, organizational, capacity development, and cooperation (International Telecommunication Union, 2024). The concept of readiness for electronic voting has been defined in various ways in the literature, with some variation depending on the specific country context. Different countries may emphasize different aspects of readiness, depending on their unique political, legal, and technological

environments. Overall, the definition of e-voting readiness is a complex and multifaceted concept, and its meaning may vary depending on the specific country's context. By considering a range of factors and perspectives, researchers and policymakers can gain a more comprehensive understanding of what it takes to prepare for and implement effective e-voting systems. Adopting the approaches described in the literature can help evaluate Azerbaijan's readiness for the introduction of electronic voting systems. The amalgamation of the literature on electronic voting readiness reveals various perspectives on the preparation required for the successful implementation of e-voting systems.

2.2. Theoretical context

The main purpose of this subchapter is to explain in detail the research question that forms the basis of the research process and the sub-questions that are related to it and support the main question. Also, in this subchapter, the criteria necessary to find an answer to the research question and the research sub-questions based on the literature reviews used are determined.

2.2.1. Research question

This study is particularly concerned with Azerbaijan's readiness to the provision of electronic voting services. The author has created a main research question to investigate this issue, which represents the thesis's overarching goal. The author is better able to arrange the research process and foresee potential obstacles or problems by clearly defining this phenomenon. The author created one main study question and 2 supporting sub-questions to cover the topic.

Research question: Is Azerbaijan ready for the introduction of an electronic voting system from the citizen and government side?

Sub-research question 1: Is Azerbaijan ready for electronic voting from a citizens' perspective?

Sub-research question 2: Is Azerbaijan ready for electronic voting from the government's perspective?

This study question gives us a way to think critically about how digital technologies are being used in elections, from the point of view of both citizens and government. Electronic voting is currently garnering significant attention as it represents an innovative approach to enhancing the transparency of democratic systems and increasing voter participation. Based on the literature used in

this study, the successful implementation of this technology requires preparation at social, technological, political, legal, and infrastructural levels. There are also hundreds of factors that affect readiness for electronic voting in addition to those listed. Many countries around the world have already implemented the electronic voting system and experienced its advantages as well as its problems. In developing countries like Azerbaijan, the application of this technology can accelerate both the modernization process and adaptation to digital technologies. The success of electronic voting depends not only on the technological and organizational preparation of the government, but also on the confidence of citizens in this system. For this reason, the level of social and technological preparation of citizens is one of the main components of the research.

Scientific research on electronic voting in Azerbaijan is limited. This question serves to fill important knowledge gaps, both academically and practically. Previous studies show that adoption of electronic voting systems requires interaction between technological readiness, level of trust, and political stability. For example, based on the literature used in this study while Estonia is a leading example in this field, implementation in other countries has faced challenges (e.g. technical and legal barriers in Jordan (Nu'man, 2012)) (Risnanto, 2019). The specific social and technological conditions of Azerbaijan make this research unique. For this reason, the question will guide important decisions in both current and future policy and technology.

Sub-research questions provide a deeper understanding of the main research question and allow it to be approached from two specific perspectives. Sub-research questions contribute to answering the main question at both the theoretical and practical levels. They provide a comprehensive examination of the topic, clarifying the existing framework and providing perspectives. This approach allows the main research question to be analyzed not only at a general level, but also on specific topics and to approach problems from different perspectives.

2.2.2. Theoretical approach to readiness for e-voting in Azerbaijan

The purpose of this chapter is to demonstrate the author's theoretical approach to understanding a country's readiness for e-voting services. The theoretical approach in this master's thesis focuses on creating a conceptual framework for assessing Azerbaijani country's readiness for the implementation of an e-voting system. With the growing global adoption of digital technologies, the use of e-voting systems has piqued the interest of policymakers, electoral officials, and citizens. The research examines variables such as citizens' attitudes toward technology, trust in the electoral

process, IT infrastructure of a country, the political and legal implications of electronic voting systems that may influence their readiness for electronic voting.

The author classified important factors in the context of e-voting into five major categories based on the literature review: technical factors, political factors, legal factors, social factors and IT infrastructure factors. Each of these categories, in turn, contains independent variables. The author acknowledges the complexity of the problem and acknowledges that there may be numerous variables influencing a country's readiness for e-voting. As a result, the author examined the literature and collected data in a systematic manner with the aim of identifying the most important factors and their interrelationships. Overall, this study provides a rigorous and systematic analysis of the existing literature as well as the data gathered during this research, giving valuable insights into the factors that may affect a country's readiness for the implementation of an e-voting system in Azerbaijan. In order to find answers to the research questions, various criteria and sub-criteria were defined based on the analysis of the available literature. These criteria are structured to provide a comprehensive framework for answering the main research questions. The established criteria cover the main directions for assessing the social, technological, legal, political and infrastructure readiness levels for the implementation of the electronic voting system in Azerbaijan. Under each criterion, additional sub-criteria are selected, which allows for detailed analysis and accurate results in the research process.

2.2.2.1. Technological and social readiness of citizens for e-voting

According to a summary of literature review for the readiness of e-voting from the citizens perspective, on the technological side, it is important that citizens have access to the internet, access to the digital devices, and digital skills. Internet penetration means how easy it is for people to get and use internet services, which are needed to get to and use e-voting systems. Digital device penetration, on the other hand, means that technology devices like computers and smartphones are widely available and easy to use. These devices are needed to use electronic voting methods. Also, how well people know how to use these tools and services is very important for the widespread adoption and use of electronic voting methods. Along with these technological elements, the idea of social preparation is also very important when it comes to using electronic voting systems. Kremer and Schuster (2008) say that 'social preparation' is how much people trust and believe in the electronic voting system. It is very important to have this part because people might not want to use computer voting if they don't

trust the system. When putting in place electronic voting, social planning is very important because hesitancy could make the system less legitimate and effective.

2.2.2.2. The government's political, legal and infrastructural readiness for e-voting

The literature study indicates that evaluating e-voting from a governmental readiness standpoint necessitates legal, political, and infrastructural readiness. An important factor to consider when assessing a country's ability to use electronic voting systems is its level of legal preparedness. An environment that is in line with democratic norms is essential for the implementation of electronic voting (Mitrou, Lilian & Gritzalis, Dimitris & Katsikas, Sokratis & Quirchmayr, Gerald, 2003). This level of preparedness includes not only technical support, but also the existence of legal mechanisms. It is also imperative that rules and standards for the implementation of electronic voting are followed (Council of Europe adopts new Recommendation on Standards for E-Voting, 2017). A robust and reliable IT infrastructure is essential to ensure a country's readiness for the implementation of an electronic voting system. This infrastructure serves as the main basis for the safe, transparent and effective implementation of the electronic voting process. IT infrastructure is essential for both preventing technical problems and ensuring the uninterrupted operation of the system. The political stability is an important factor for citizens to be ready for electronic voting (Krimmer and Schuster, 2008). For this reason, political stability will be studied. Public discussions regarding the implementation of the electronic voting system are of great importance in terms of assessing the attitude and acceptance of society and the government towards this technology (Fedorov, 2021). Therefore, it is important to study the political discussion on the topic of e-voting in Azerbaijan.

The indicators and criteria to be used, determined based on the literature review to answer the research question and supporting research questions, are summarized and shown in Table 3.

Approaches	Indicators	Criteria
Citizens' readiness	Technological readiness	Internet access
		Digital device access
		Digital skills
	Social readiness	Trust
Government's readiness	Political readiness	Political stability
		Political discussion
	Legal readiness	Legal framework
	Infrastructure readiness	IT infrastructure
		Security

Table 3. A set of indicators and criteria to be used to measure Azerbaijan's readiness for electronic voting. Source (Literature review). Prepared by the author

3. Data and methodology

This chapter presents the methodology for studying this research question. A qualitative approach and data collection approach were used to achieve the research objective. This chapter describes and justifies the decisions regarding the qualitative and data collection methodologies. In order to ensure the objectivity of the research and the accuracy of the results, the author conducted extensive interviews, collected information on the topic from reliable and up-to-date sources, analyzed and compared this information. The limitations of the method were also discussed by the author. The case of Azerbaijan is the focus of this study. The purpose of the applied research methods was to determine the readiness of Azerbaijan for electronic voting from the perspective of the government and citizens.

3.1. Qualitative approach

Moreover, the primary objective of this research study is to examine the readiness of e-voting services from the perspective of citizens and government. This research problem is intricately linked to human and government perceptions and attitudes, underscoring the need for a multidisciplinary research approach that incorporates perspectives from various research fields. Given the complex nature of the research topic, it is important to use a qualitative research methodology to examine Azerbaijan's readiness for e-voting from a citizen and government perspective. Furthermore, considering that the implementation of electronic voting systems in Azerbaijan has not been studied extensively, and the topic remains largely unexplored, there is a paucity of sources and information available to initiate a comprehensive investigation. Applying qualitative methods to understudied phenomena or research topics allows us to gain better understanding in areas with a limited data base, analyze the experiences and motives of subjects, and generate new ideas (Saini and Shlonsky, 2012). In view of this, the use of qualitative research methodologies would be beneficial in providing a rigorous and systematic approach to investigating the research problem. Interviews could be conducted to collect relevant data and generate evidence-based insights that can inform decision-making related to the implementation of an electronic voting system in Azerbaijan. To assess the readiness of the country towards the implementation of electronic voting in Azerbaijan, multiple dimensions and factors need to be evaluated. To examine Azerbaijan's readiness for electronic voting

from the perspective of citizens and the government, it is planned to interview people related to the topic and use the responses to find answers to the research question and sub-research questions.

3.1.1. Background

Within the framework of the application of the qualitative method, individual interviews were conducted with 6 experts to explore the depth and various aspects of the topic. The interview process was carefully planned, and the selection of experts was based on specific criteria. The main goal was to collect more comprehensive and practical ideas on the topic by obtaining approaches from different perspectives. When selecting experts, their knowledge and experience in the research topic were taken into account as the main criteria. Each interviewee was an individual working in the field of e-government services and could directly influence the topic. This approach created the conditions for collecting information from experts representing different sectors and for a better understanding of different aspects of the topic. The information obtained from these interviews created a solid basis for studying not only the theoretical aspects of the topic, but also its practical applications. The perspective of each expert was important for a better understanding of the current state, potential opportunities and existing problems of the digitalization of public services and increased the depth of the study. As a result, this approach significantly contributed to the study presenting more objective and multifaceted results on the topic. Due to the sensitive nature of the topic, an agreement was reached between the author and the interview participants to maintain the anonymity of the interview participants. Also, considering the interviewees' wishes, no recording devices were used during the interviews. The profiles of the interview participants are as follows.

- Expert 1 - A bureaucrat working on the implementation of the government's digitalization policy
- Expert 2 - Director of a company providing software services for state bodies
- Expert 3 - Party leader
- Expert 4 - OSCE election observer
- Expert 5 - Journalist
- Expert 6 - Researcher conducting research on the digitalization of public services

The diversity of the interviewees' backgrounds allowed them to approach the issue from different perspectives in their answers to the questions on the topic. In order to conduct the interview in a planned manner, the author prepared basic and auxiliary questions related to the topic.

Furthermore, additional clarifying questions were used during the interview based on the discussions to explore the topic in more depth. The interviewees were asked questions about the current situation in the country, potential problems, gaps, and suggestions to assess the technological readiness and social readiness of Azerbaijani citizens, as well as the political, social, and IT infrastructure readiness of the Azerbaijani government. The interviewees' responses were collected and analyzed by the author.

3.1.2 Interviews related to citizens' readiness

Upon synthesizing the responses provided by the respondents, it can be inferred that Azerbaijani citizens exhibit a partial readiness regarding their access to the Internet, availability of digital devices, and proficiency in utilizing such devices. In general, despite significant progress made in the realm of digitalization within the country, a primary deficiency remains disparities between rural and urban regions. According to Expert 1, the statistical study conducted under the name of the specific weight of the population using the Internet also shows that the weight of the population using the Internet for 2015-2023 was in the range of 77-89 percent, and it is evident from the data that there has been an increase over the years. Efforts are underway to disseminate Internet access throughout the nation via the implementation of fiber optic infrastructure. The government's commitment to enhancing the population's Internet access is evident. Experts indicate that internet service providers are installing fiber optic internet lines in nearly all regions of the country, thereby enhancing the population's access to high-speed internet. Although the quality of mobile internet services is commendable in urban areas, the speed deficiency in rural areas is extremely poor. An assessment of the general accessibility of the Internet, based on expert responses, indicates that the Internet's accessibility within the country is adequate for the utilization of electronic services. Experts indicate that nearly the entire population of the country possesses handsets with Internet connectivity; however, a significant portion of the populace lacks access to computers. Expert 2 articulated that, given the relatively higher cost of computers compared to smartphones and the fact that not all individuals possess the inclination to utilize them, many do not contemplate the prospect of acquiring one. Furthermore, Expert 6 indicated that a deficiency in knowledge or a disinterest in acquiring information regarding the utilization of electronic devices among a specific demographic diminishes the opportunities for engaging with such technology.

According to the experts' attitudes to the questions asked about the readiness to use digital devices, the digital skills of the country's population are assessed as average. Although the middle

generation uses digital devices and digital services without difficulty, the older generation is not very open to innovations. Expert 3 asserts that the older generation lacks the digital proficiency to utilize innovations and primarily relies on the younger generation for assistance. He further posits that if electronic voting is instituted and older representatives continue to receive support from the younger generation, it will result in a breach of the fundamental principle of electoral secrecy. Expert 3 asserts that the implementation of electronic voting must be straightforward and comprehensible for all individuals. Serious awareness-raising measures will also be necessary in this regard. Expert 1 asserts that the low literacy levels among certain individuals in the country restrict their capacity to utilize electronic services. Despite official data estimates indicating a literacy rate exceeding 99 percent, this figure does not accurately represent the true situation. Expert 1 also noted that official reports may reflect the number of individuals who have finished primary and secondary education; nevertheless, not all graduates possess the capability to utilize electronic resources. According to Expert 2, if electronic voting is to be implemented, the technological readiness of citizens is good enough to successfully complete the process. Expert 2 added that there are some regions in Azerbaijan that are very remote and far from not only technological innovations but also infrastructure in general, such as very mountainous and remote areas. Also, when looking at the age ratio of citizens, only very old people have a problem with digital skills, access to digital tools and the Internet. According to Expert 2, traditional voting opportunities could be maintained in parallel with electronic voting to take into account citizens living in regions with weak IT infrastructure and the older generation.

Differences were observed in the experts' attitudes to the questions asked about citizens' trust and confidence in electronic services. Thus, according to the opinions of expert 1, expert 2, expert 3 and expert 6, citizens have trust in digital services. Expert 1 added that the public who use electronic services and understand their importance have trust in electronic services, but a certain public believes that the digitalization of the process is no different from the traditional process. Expert 1 added, especially people with a low level of education insist on this opinion. Expert 1 stated that in certain cases, although institutions providing electronic services have digital the service, they retain traditional bureaucratic obstacles (for example, they require unnecessary documents), but this should not be the basis for a general approach and today, citizens can view many documents through the electronic cabinet and can use some services completely electronically without leaving home. According to Expert 2, as Azerbaijan is transitioning to the digital era, there are certain shortcomings in citizens' trust in electronic services. Even if the state provides some services in digital form, it is observed that citizens refuse to do so in some cases. Expert 2 assesses the weak interest of citizens in

using electronic services not as a lack of trust, but as a difficulty of the transition period. According to Expert 2, the government should make more efforts to educate about the digital services it provides, and citizens should give the government a chance, and thus trust can be formed between the government and citizens in the sphere of electronic services. Also, according to the opinions of expert 3, citizens who use electronic services become its regular users, which is the main indicator of trust in electronic services. Expert 6 asserts that, alongside trust, habits significantly affect citizens' decisions. Despite the availability of certain electronic services in both traditional and digital formats, individuals occasionally favor traditional methods due to their familiarity. Expert 6 noted that digital services are occasionally more economical than traditional services regarding time, resources, or costs. Furthermore, Expert 6 indicated that although certain public and private sectors advocate for the utilization of electronic services, it remains evident that citizens continue to prefer traditional services, despite the increased time expenditure and associated fees, which is attributable to their ingrained habits in this decision-making process. According to Expert 4, although there is a certain level of trust among the population, the situation is not conducive to saving. After the launch of some electronic services, the results were not encouraging, which affected people's trust in electronic services in the country. According to Expert 4, the government should maintain sustainability in electronic services along with continuity and conduct constant education. In order to build trust in people, it should create opportunities for people to experience electronic services. However, it should first be sure of the quality of the service provided. Also, according to Expert 5, due to trust problems, traditional services prevail among citizens in relation to electronic services.

3.1.3. Interviews related to government's readiness

In terms of Azerbaijan's political readiness for electronic voting, the experts' opinions generally complemented each other. Experts believe that the government needs to seriously reform its political system. According to the 1st expert, voting in the Republic of Azerbaijan is used in presidential elections, parliamentary elections, municipal elections, and referendums. In his opinion, interest in referendums and presidential elections in Azerbaijan is greater than in municipal elections. Expert 1 indicated that the reason is that the activities of the municipal institution are not organized in the desired form and that the population is not aware of the importance of the municipal institution. Since other election processes are considered a national issue for the population, they participate in these elections more willingly, but overall political participation in the country is weak. Expert 1 also stated that although political participation is weak in the country, everyone can hold discussions and express their position on social media, in parks, in cafes, in other words, everyone can use the

resources at their disposal to discuss and express their position. Expert 1 asserts that Azerbaijan lacks political stability, with political institutions predominantly governed and influenced by the government. Expert 1 associates political instability with the inadequate engagement of citizens in matters that govern social coordination. Expert 1 asserts that the abandonment of political processes by society enables authorities to assume control over them with relative ease. When society addresses issues impacting the nation's overall status, the political landscape of the country can be more accurately evaluated. Expert 2 stated that Azerbaijan can be considered a partially political country and, in his opinion, there was political tension in the country before the 2020s, but since 2020, there has been no serious political tension compared to previous years and Azerbaijan can be considered partially politically stable. According to Expert 3, the population over 30 years of age closely follows political processes more closely than the newly formed younger generation. For the younger generation, political processes and political participation are not of great importance. Expert 3 also added that the inappropriate situations in the election process are one of the factors that alienate people from the political process. Expert 3 additionally noted that in the 2020 parliamentary elections, the government launched a new campaign, strong PR created new hope and new enthusiasm in people, but unfortunately the process did not take the desired form in the end. If such a campaign is conducted again and continuity is ensured, good results can be achieved. According to Expert 4, the country's political stability is very weak, and although steps are sometimes taken by the government, it is not possible to achieve serious results in the end, and more serious steps need to be taken in this direction. Expert 5 blames the government and citizens for the poor political preparation, and he states that citizens participate poorly in general political processes, do not support their elected officials, and do not ensure the protection of their votes at polling stations. Expert 6 also shared his views on the insufficient level of political preparation. Expert 6 asserts that Azerbaijan can be regarded as politically stable, however this stability fluctuates periodically. Expert 6 justified his opinion by saying that the recent successes of the government have gained the trust of the people and have influenced the political processes in the country. Expert 6 also noted that if a survey had been conducted in Azerbaijan at the end of 2020, Azerbaijani citizens would probably consider Azerbaijan politically stable and themselves one of the happiest people in the world. Because in the mentioned history, Azerbaijan won a war very easily and the people were happy. In the referenced historical context, Azerbaijan achieved a swift victory in a war, resulting in the populace's elation. Expert 6 further noticed that during the specified times, both the Azerbaijani populace and opposition parties endorsed the government's policies; nevertheless, in prior years, governmental failures led to public protests and governmental repression. According to Expert 5, people have been conducting

discussions mainly on social media lately, and those who express a serious political position on social media and engage in discussions are sometimes subjected to pressure from the government. For this reason, people discuss political discussions with people they trust more, in private rather than in public. Expert 3 assesses political discussions very poorly. In his opinion, one of the main reasons for this is the low interest of citizens in politics, and compared to previous periods, serious political discussions are currently not being held in the country at the level of citizens, opposition, and government. According to Expert 3, citizens are not very interested in political discussions due to both low interest and potential risks, and the discussions that are held are held within a limited framework.

Experts mainly agreed on the legal readiness perspective for electronic voting. In the opinion of experts, Azerbaijan has already come a long way in this direction and no serious risks are seen in relation to legal readiness. Expert 1 also added that there is legislation of the Republic of Azerbaijan in the field of personal data protection. At the same time, the Code of Criminal and Administrative Offenses provides for measures against misuse of relevant data. Based on expert 1, in addition, civil legislation also creates sufficient opportunities for individuals to restore their rights in court. However, in the event that electronic voting is implemented, it will be necessary to improve the legal framework, proceeding from the mentioned service. Expert 4 stated that there are many gaps in the Azerbaijani legislative framework, but the recent serious reforms in this direction will have a positive impact on the process. According to Expert 4, some adjustments have been made in the legislation in recent times to implement and regulate the digitization policy, and such steps are expected to continue. According to Expert 5, the legislative framework in Azerbaijan in many areas is very well designed, and there is no doubt that if electronic voting is to be implemented, the necessary legal framework for the implementation of electronic voting will be taken into account. Expert 5 asserts that, notwithstanding a well-structured legislative framework, challenges persist in meeting the legal requirements in certain domains. Expert 5 also added that the requirements of the legislation are partially protected and, as an example, stated that the mandates of 4 deputies were revoked due to fraud in the 2020 parliamentary elections. This issue is directly attributable to the insufficient efficacy of the agencies responsible for overseeing and enforcing the legislation. Expert 5 indicated that, for instance, under Azerbaijani legislation, individuals who engage in electoral fraud are subject to criminal liability; however, no definitive measures have been implemented in this context. Expert 5 contends that, in addition to the creation of a legislative framework, there is a pressing need for reforms in the administration of the application and enforcement of legislation, which could potentially resolve a multitude of issues. According to Expert 6, in the case of services currently

available in the country, the legislative framework is well designed, and he also added that international standards have been followed for existing electronic services, and there is no problem with applying the same approach in the event that electronic voting is implemented.

The readiness of the country in terms of information technology infrastructure for the implementation of electronic voting was generally assessed positively. According to Expert 1, in order to conduct electronic voting, the population's access to the Internet should be at least over 99 percent, the population's access to electronic devices should be increased, and work should be done to increase the population's skills in using electronic resources and electronic services. Even in the current situation, there is potential for conducting electronic voting, but this will create certain difficulties. According to Expert 1, there are differences between urban and rural areas in terms of technological infrastructure, which can seriously affect the organization of voting in these places. Expert 2 highly assessed the country's IT infrastructure readiness and also reported that in recent times, state bodies have been paying special attention to the security of electronic systems. Expert 2 also noted that many state bodies are already placing orders for pentesting electronic systems, and in addition, security agencies operating in Azerbaijan are also carrying out serious work to protect and ensure the security of services provided by the state and the data of service users. According to Expert 4, the country's IT infrastructure is generally suitable for mass services such as e-voting. It is clear that there is a lag in digitalization in some remote regions, but this will not pose a serious problem as it constitutes a very small part of the total population. According to Expert 5 and Expert 6, although the country's IT infrastructure is stable, they will have to continuously take measures related to cybersecurity. Expert 5 observed that there have been media reports concerning external interference in electronic voting systems in certain nations, which are regarded as being more advanced than our country in terms of information technology infrastructure. Therefore, if electronic voting is implemented, the government should pay special attention to cybersecurity measures against external interference. Expert 6 also added that in recent years there has been a competition among all institutions in the country regarding the development of IT infrastructure and its effects can be seen. According to Expert 6, such a rapid digitalization can potentially create security problems. While government agencies are trying to digitize their services and increase their number, they should prioritize the security of their users.

During the interviews, experts expressed their opinions on the topic from different perspectives, both in terms of citizens' readiness and the government's readiness for electronic voting. The table 4 below, compiled by the author, reflects the generalized responses based on the

interviewees' answers to the questions related to the Azerbaijan government and citizens' readiness for e-voting.

Factors	Indicators	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6
Technological readiness	Internet access	Partially ready	Partially ready	Partially ready	Partially ready	Partially ready	Partially ready
	Digital device access	Partially ready	Partially ready	Partially ready	Partially ready	Partially ready	Partially ready
	Digital skills	Partially ready	Partially ready	Partially ready	Partially ready	Partially ready	Partially ready
Social readiness	Trust	Ready	Ready	Ready	Not ready	Not ready	Ready
Political readiness	Political stability	Partially ready	Partially ready	Not ready	Not ready	Not ready	Partially ready
	Political discussion	Partially ready	Partially ready	Partially ready	Not ready	Not ready	Partially ready
Legal readiness	Legislation	Partially ready	Partially ready	Partially ready	Partially ready	Partially ready	Partially ready
Infrastructure readiness	IT infrastructure	Ready	Ready	Partially ready	Partially ready	Partially ready	Partially ready
	Security	Partially ready	Ready	Partially ready	Partially ready	Partially ready	Partially ready

Table 4. Overview of answers to interview questions. Source (Interviewees). Prepared by the Author.

Despite the varied approaches of the experts, the resulting image is remarkable for its uniformity across numerous metrics. A generalized statement is presented in the result section based on the collected data, case studies, and interview responses regarding the readiness of Azerbaijani citizens and the government for electronic voting.

3.2. Data collection

Properly selected and applied data collection methods are one of the main conditions for successful research results. These methods provide important tools for finding accurate and comprehensive answers to research questions, comprehensively exploring the topic, and achieving objective results. The reliability and depth of research results directly depend on the quality of the

data collection process. Therefore, careful selection of data collection methods and their application determine the overall quality of the research.

Various processes have been implemented in Azerbaijan for a long time within the framework of the e-government policy. E-government initiatives and projects implemented in the field of digitalization provide a database for research. This includes, in particular, access to statistical reports and information obtained on the operation of existing e-services. Such statistical data can help to find answers to key questions related to the topic, such as the results of the government's e-government efforts, the number of users, the effectiveness of the system, and its scope. As a result, the use of statistical data allows the research to obtain more objective and reliable results. This provides a broader perspective on the topic and contributes to the assessment of the current situation regarding the implementation of the e-government policy in Azerbaijan. Thus, the use of statistical data acts as an important tool that strengthens both the theoretical and practical aspects of research.

The author carefully planned the data collection procedures and carried out this process in a consistent and systematic manner. The main goal during the data collection phase was to ensure that the research was conducted in an accurate, objective and scientifically sound manner. To this end, the author used reliable sources to ensure that the research achieved substantiated results. The data collected were obtained from a variety of sources. These include scientific literature, official reports, statistical indicators and field studies. Such diversity of data ensured a broad-spectrum justification of the research and a comprehensive analysis of the issues. The data collected will be discussed in detail below, explaining how they served the research objectives, what methods were used in the analysis process and how they contributed to the results.

3.2.1. Citizens' readiness

The results of the research conducted by the author on this topic to examine Azerbaijan's readiness for electronic voting from a citizen's perspective have shown that two main criteria are important for assessing the level of readiness - technological and social readiness.

Technological readiness refers to factors such as the country's citizens' access to the Internet, access to digital devices, and technological skills. Social readiness, on the other hand, takes into account citizens' trust and confidence in the electronic system provided by the government. Taking these two main aspects into account, the author conducted a more in-depth analysis to examine how the implementation of electronic voting will be received in Azerbaijani society, possible problems,

and ways to solve these problems. This approach serves to emphasize the importance of assessing both technological development and social readiness in parallel.

The Ministry of Digital Development and Transport of the Republic of Azerbaijan, the State Statistical Committee of the Republic of Azerbaijan, and the International Telecommunication Union published a report titled “Azerbaijan Digital Development: facts and figures” in 2023. This report helps to find answers to many questions regarding the technological readiness of Azerbaijani citizens. According to the Azerbaijan Digital Development report, the percentage of internet users in Azerbaijan in 2022 was 88.1%. This indicator shows an increase compared to previous years and indicates the rapid spread of the use of digital technologies in the country. At the same time, based on Azerbaijan Digital Development report the percentage of households with internet access was 87.8% in 2022, which reflects the expansion of internet infrastructure and the increase in the population's access to the internet. These indicators indicate that the digital transformation in the country is continuing rapidly, and internet services have become an integral part of daily life. Another key indicator when assessing the technological readiness of Azerbaijani citizens is their access to digital devices. Ensuring citizens' access to modern technologies is an essential condition for the successful implementation of electronic services, especially the electronic voting system. In this regard, the level of development of the country's digital infrastructure, as well as the accessibility and level of use of digital devices, play an important role. Available statistical data indicate that the situation in this area is generally positive. According to the Azerbaijan Digital Development report for 2022, 75.8% of households in Azerbaijan own computers. This indicator demonstrates significant progress towards digitalization in the country. At the same time Azerbaijan Digital Development report shows that 81.5% of the population uses computers and applies technologies in their daily lives confirms that the level of digital literacy of citizens is quite high. These indicators reflect both the development in the field of technology and the ability of people to adapt to technologies. However, the existing differences in access to digital devices also reveal certain shortcomings. According to the Azerbaijan Digital Development report, 86.5% of households in urban areas own computers and in rural areas, this figure is 64.6%. This difference indicates the uneven distribution of digital technologies between urban and rural areas and the need to develop technological infrastructure in rural areas. Limited access to digital devices in rural areas compared to cities is one of the main factors that may hinder the comprehensive implementation of electronic voting. It should also be noted that based on the Azerbaijan Digital Development report in 2022, 85.5% of the urban population was a smartphone user, which indicates a high level of penetration of digital devices in the urban environment and among

the rural population, this figure was 77.4%. Although this ratio indicates that access to digital devices, especially smartphones, is somewhat limited in rural areas compared to cities, it proves that smartphones are widespread throughout the country in general.

On the other hand, the level of use of digital technologies also differs significantly between age groups. According to the Azerbaijan Digital Development report, 84.4% of the population under the age of 64 are computer users, while this figure is 57.6% among the population over the age of 64. This difference indicates that the older generation is less familiar with technology and this group needs special attention in the electronic voting process. At the same time, in compliance with the Azerbaijan Digital Development report the proportion of internet users also varies by age category: 78.6% of those under 24, 96.1% of those between 25-35, 95.7% of those between 36-64 and 66.8% of those over 64 are internet users. These figures confirm that the younger generation in particular is better adapted to digital technologies and is more active in this area compared to the older generation. It is reasonable to assume that these differences also have an impact on the use of electronic services.

According to the Azerbaijan Development Report, in 2022, 7.3 percent of internet users in Azerbaijan used the internet for the purpose of interacting with state bodies, and in 2018 this figure was 6.2 percent, and there was an increase in this direction in 2019 and 2020, and after a slight decrease in 2022, an increase was observed again in 2022. However, detailed information about the basis of this indicator is not available. Thus, it is impossible to determine based on the mentioned information why this segment or a segment not related to it does not use the internet for interaction with state bodies.

3.2.2. Country's readiness

According to the literature, the most important factors for a country to be ready for electronic voting from the government's side are the existence of the country's IT infrastructure, the legislative framework and the political environment. Information related to the factors mentioned in the example of Azerbaijan was consulted.

Currently, a digitalization policy is being implemented in Azerbaijan in all directions. This, in turn, creates a demand for the formation of a sustainable, durable and secure IT infrastructure. In recent years, much work has been done to expand the IT infrastructure, certain steps have been taken at the legislative level, and orders and decrees have been issued by the President of the Republic of Azerbaijan. Thus, one of the main steps can be indicated as the adoption of the "Strategic Roadmap

for the Development of Telecommunications and Information Technologies in the Republic of Azerbaijan", approved by the Decree of the President of the Republic of Azerbaijan in 2016. The strategic roadmap was prepared taking into account the new challenges and opportunities facing the telecommunications sector in order to increase the development potential of information and communication technologies in the country, improve the ICT infrastructure for the digitalization of the economy, effectively meet the demand for ICT services through internal resources, and further increase efficiency through the application of ICT in the activities of the public sector (Strategic Roadmap for the Development of Telecommunications and Information Technologies in the Republic of Azerbaijan, 2016). Also, priority areas such as building an innovation-oriented and knowledge-based economy, producing high-quality and competitive information technology products in international and local markets, attracting new investment projects based on high technologies, and establishing effective coordination between entities operating in this field were taken into account (Strategic Roadmap for the Development of Telecommunications and Information Technologies in the Republic of Azerbaijan, 2016). In addition, the President of the Republic of Azerbaijan issued a decree on improving governance in the field of digital development in 2021 (On improving governance in the field of e-government, 2021). Also, in 2024, an order was issued by the Cabinet of Ministers of the Republic of Azerbaijan on improving governance in the field of e-government. One of the steps taken to contribute to the development of Information and Communication Technologies in Azerbaijan was the establishment of the Innovation and Digital Development Agency in 2021 and agency aims to organize activities in the field of digital transformation in the country, form a local innovation environment, and establish and organize a digital government and a digital society (Innovation and Digital Development Agency, 2024).

The results of Azerbaijan's Global Innovation Index (GII) for the last 4 years show that there are some improvements and setbacks. Thus, Azerbaijan ranked 82nd in the Global Innovation Index in 2020, 80th in 2021, 93rd in 2022, 89th in 2023, and 95th in 2024 (Organization United Nations Industrial Development, 2023). According to the report, the statistical confidence interval for Azerbaijan's GII 2024 ranking is between 87th and 98th places (Organization United Nations Industrial Development, 2023). Along with a country's IT infrastructure, it is one of the main factors in the security of that infrastructure. Security is at least as important as digitalization. The National Cyber Security Index ranks Azerbaijan 21st on the National Cyber Security Index and 50th on the Global Cyber Security Index (2024). For a country that has just joined the digitalization process, these indicators can be assessed quite well.

Azerbaijan's E-Government Development Index (EGDI) and E-Participation Index (EPI) indicators reflect positive development dynamics in recent years. Azerbaijan, which ranked 74th in the EGDI in 2024, has shown significant progress compared to 2022 (UN E-Government Survey, 2024). Thus, the country ranked 83rd in that index in 2022. This demonstrates that the steps taken by the state towards the development of digital services are effective and that it has achieved significant achievements in the field of application of information technologies. Azerbaijan ranked 88th in the E-Participation Index (EPI) for 2024 (UN E-Government Survey, 2024). This score indicates the options for citizens to engage with the state in the digital realm and partake in public governance. The progress in both indicators shows that the digitalization strategies implemented in the country are in the right direction and that an effective governance model is being applied in state-citizen relations. Such progress in the field of e-Government of Azerbaijan supports the increase of international competitiveness, the application of innovative technologies and the acceleration of digital transformation processes. This creates a foundation for achieving higher results in the coming years.

The topic is relatively new in Azerbaijan and the steps directly related to it have not yet been fully formed. It is also important to note that the number of comprehensive studies in this area in Azerbaijan is limited and the application of international experience in the local context has not been sufficiently studied. However, within the framework of this study, some of the work done in the country towards the digitalization of government is particularly highlighted. In recent years, the Azerbaijani government has launched a number of critical e-services, such as "mygov", "Asan Bridge", and "SIMA". Although the mentioned e-services are not directly related to e-voting, they form the infrastructure environment for the implementation of e-voting.

The "mygov" has made many government services available online for citizens in Azerbaijan and has served the principles of transparency and convenience in governance by transferring the interaction between the state and society to the digital level. The "mygov" system serves as Azerbaijan's digital government platform, offering citizens and businesses digital access to government services ("mygov",2025). The main goal of the platform is to optimize the lives of citizens by simplifying the process of accessing digital government, reducing bureaucratic obstacles, and increasing trust in government services. Currently, the "mygov" platform cooperates with a total of 42 government agencies, including 14 ministries, and offers electronic services for the activities of the mentioned agencies ("mygov",2025). The "mygov" platform serves as an excellent model for both citizens and the government. The aforementioned platform has facilitated the development of digital

habits among both the government and citizens. Thus, the total number of users of the platform is 261,331 people ("mygov",2025). To access the platform, citizens must register online and authenticate their identities. Citizens can also log in to the system with other online identification tools such as the "SIMA" electronic signature and the "SIMA" token signature. Applying the identification system during system login prevents external access and establishes a secure login process. One of the noteworthy points is that work has been done to electricize the services provided by the Central Election Commission via "mygov" ("mygov",2025). Currently, 6 services belonging to the Central Election Commission are operating in "mygov" ("mygov",2025). Through the electronic system, citizens can determine the polling station where they should vote, view the addresses of polling stations, send an application for changing the polling station, and also submit an application online on any topic (proposal, complaint, etc.).

One of the results of the implementation of Azerbaijan's digitalization policy is "Asan Bridge". Inter-agency data exchange in Azerbaijan has been partially carried out since 2022 and is now entirely through "Asan Bridge" (2022). Before "Asan Bridge" existed, Azerbaijan used the Estonian product "X-road" system for secure data exchange (Best Solutions, 2018). Currently, the transfer of services through the "mygov" to other institutions is carried out by "Asan Bridge", making this process more secure. Also, according to Shahin Aliyev, Deputy Chairman of the Board of Directors of the Innovation and Digital Development Agency under the Ministry of Transport and Digital Development of Azerbaijan, in order to ensure the security of "mygov", the database is not stored directly in the "mygov", and the information collected from relevant institutions through a request is shown to the "mygov" (Report, 2023). Based on the information available, we can assume that there is an example of "mygov" in Azerbaijan, which has an identification system and provides digital services to citizens in a secure manner.

The principles of authentication, encryption, security, anonymity, and transparency should guide the establishment of the main requirements for the technical workflow of electronic voting systems (Dhane, S. D., & Rathod, S. B. 2022). These principles are the basic indicators that ensure the successful implementation of electronic voting. Thus, the presence of functionalities such as authentication and security in the "mygov" platform can play an important role in the implementation of an electronic voting system in the future. Simultaneously, the citizens' familiarity with electronic services and authentication methods presents a significant advantage. This not only increases citizens' trust in digital solutions but also facilitates the transition to new technologies such as electronic voting.

In the event that electronic voting is implemented, the existing technical potential of the "mygov" platform can be used as a basis for the successful operation of the system. In addition, it is necessary to strengthen the system with more extensive security measures, transparency mechanisms, and features that ensure anonymity.

In addition to the IT infrastructure, it is also important to have political and legal readiness for electronic voting. There are many factors that will affect it politically, and it is not possible to touch on each of them in detail within the scope of this diploma work. When we say politically, we mean discussions about electronic voting based on nerves and the political stability of the country that will implement electronic voting. There have also been many discussions by state officials on electronic voting on the Azerbaijani agenda. According to Rufat Gulmammadov, Director of the Information Center of the Central Election Commission of Azerbaijan, if electronic voting is reflected in the legislation, it is possible to solve it without any technical problems (Karimova, 2015). In this context, the notion that technical issues can be resolved is rational; nonetheless, this strategy must include a wider array of methodologies for the effective execution of electronic voting. The implementation of electronic voting, albeit a contemporary advancement, necessitates thorough planning to ensure its beneficial effect on the nation's social and political stability.

Also, Bakhsheyish Askerov, a member of the Central Election Commission (CEC), stated that each voting rule has its own pros and cons, and taking into account the best practices in this field, the application of the latest innovative solutions in Azerbaijan can be considered in the future (Babayeva, 2021). This method necessitates both receptivity to the utilization of contemporary technologies and meticulous execution of each phase, considering the historical and social contexts of the nation. The implementation of best practices should not be automatic, but rather aligned with the requirements and demands of Azerbaijani society. According to Osman Gunduz, President of the Azerbaijan Internet Forum, the advances in the technological field in Azerbaijan have created favorable conditions for the introduction of electronic voting in Azerbaijan and he also said that although there were attempts to do so in the 2000s, this process was not continued later and no concrete steps were taken by the Central Election Commission (2024). These thoughts of Osman Gunduz, the President of the Azerbaijan Internet Forum, on electronic voting provide an important insight into technological development in Azerbaijan and its potential impact on electoral processes. As he notes, the technological advances in the country, especially digitalization and the development of information technologies, create a favorable environment for the implementation of an electronic voting system.

However, the points Gunduz emphasizes show that the necessary legal, organizational and managerial steps have not yet been taken to fully utilize these technological opportunities (2024). The fact that Osman Gunduz recalls the initial attempts made in the 2000s regarding electronic voting and the Central Election Commission's failure to take concrete steps in this area may indicate that the issue is not among the priorities or that a broader public and political agreement is required for the implementation of the system (2024). The successful adoption of electronic voting necessitates not only the modernization of technological infrastructure but also the revision of the legal framework, the execution of voter education initiatives, and the attainment of widespread public support. According to Osman Gunduz's insights, it can be asserted that while the velocity and capacity of technological advancement in Azerbaijan presently offer opportunities for the implementation of such innovations, a more proactive stance is necessary from the government and pertinent institutions for this process to materialize. This method necessitates both receptiveness to the utilization of contemporary technologies and meticulous execution of each phase, considering the nation's historical and social context. The implementation of best practices should not be automatic; rather, it must align with the criteria and demands of Azerbaijani society. MP Tahir Mirkishili, Chairman of the Committee on Economic Policy, Industry and Entrepreneurship of the Milli Majlis, issued a significant declaration concerning electronic voting in 2021. He says that the paramount factor for the deployment of electronic voting is the establishment of a contemporary and dependable infrastructure (Will electronic voting be implemented in Azerbaijan?, 2021). Tahir Mirkishili said that important steps have been taken in this direction, and a number of technical and organizational issues have already been resolved. However, the MP noted that the implementation of the electronic voting system is not limited to infrastructure alone, and it is necessary to ensure a high level of security issues in this process (Will electronic voting be implemented in Azerbaijan?, 2021). According to the MP, the issue of implementing electronic voting is currently not on the agenda of the Milli Majlis and research and evaluation of technological capabilities in this direction continue.

Factors such as institutional stability, type of government, political participation, voter turnout, and political goals are also considered important factors for the country's adoption of electronic voting from a political perspective. According to the Stability of Democratic Institutions Index, Azerbaijan is rated 2 out of 10, and according to statistics, no progress has been recorded in this direction over the past 10 years. Azerbaijan's rating of 2 out of 10 in the Stability of Democratic Institutions Index indicates that the country faces serious problems in the field of democratic governance and institutional sustainability (Stability of democratic institutions index, 2024). The low index also

demonstrates the inability of democratic institutions to function effectively and limited opportunities for the development of civil society. The lack of significant progress in these indicators over the past 10 years emphasizes the lack of continuity and systematic approach in the implementation of democratic reforms. Although there have been attempts to make certain changes in some areas during this period, the overall picture has not progressed. In order to improve this indicator, it is important to take steps such as prioritizing democratic reforms and increasing support for the development of civil society. The Political Stability Index indicates that Azerbaijan is ranked 180th out of 214 countries based on 2022 data (SAARC Country Political Stability Index, 2022). Freedom House's report rated the freedom of dissenters to express their views on political and other sensitive topics at 1 out of 4, and the report said that dissenters' means of communication were controlled by the government (2024). This indicator signifies the presence of issues inside the country regarding the political climate, stability of governmental institutions, and sustainability of governance. Such indices are important indicators for assessing the country's position both in domestic politics and in the international arena. For this purpose, large-scale reforms aimed at ensuring political stability should be implemented and attention should be paid to initiatives that strengthen public trust.

One of the factors that embodies the government's readiness for electronic voting is the existence of legal readiness. When talking about legal readiness, it is important to have a legislative framework for electronic voting. The legislative framework should not only support the implementation of electronic voting, but also support the state's digitalization policy. Considering that electronic voting has not been implemented in Azerbaijan, no specific steps have been taken in the legislation regarding electronic voting. However, it should be noted that over the past 5 years, a digitalization policy has been implemented in many state services, and as part of this digitalization policy, certain progress has been made at the legislative level. In 2024, the President of the Republic of Azerbaijan issued a decree on the approval of the "Model Statute of State Information Resources and Systems" and the regulation of some related issues. This decree aimed to provide legal support for the digitization policy. One of the noteworthy points in the decree is that the relevant groups have been instructed to determine security criteria for information systems, ensure the security of the mentioned state service information systems, and conduct regular security audits (2024). One of the issues highlighted in the decree is the presence of notes on ensuring convenient use and information exchange without additional operations (2024). In addition, the decree provides for the presence of software and technical components that enable the development of the state information resource and

system, and the constant improvement of that information resource and system using the latest technologies (2024).

3.3. Limitations

The foundations of academic research are based on the decisions, choices, and methodological approaches that the researcher makes. The opinions expressed by participants during interviews are also important for the quality and validity of the research. However, it is important to acknowledge that any research endeavor may be limited by a number of known and unknown limitations and obstacles. These limitations can affect the research process and affect the depth of the results. This study is no exception and additional difficulties are likely to arise during the implementation of the project. Therefore, it is important to identify the limitations that arise in the research process, describe their effects, and develop appropriate strategies to minimize these effects.

Politics can be considered a sensitive topic, and a number of problems may arise when researching political topics. In particular, difficulties may be observed in terms of participants expressing their views freely and openly participating in the research process. The sensitivity of political topics forces researchers to apply special approaches that will ensure the comfort and trust of participants. To deal with these problems, extra care was taken to make sure that participants' privacy and identity were respected. The people who were interviewed were told in detail about the study's goal and subject, and they were reassured that the information gathered would only be used for research. This method made it easier for people to trust the research process and give their honest views. The lack of existing academic research on the implementation of the electronic voting system in Azerbaijan created particular difficulties in data collection. The novelty of the research topic and the limited availability of available data sources make it difficult to conduct research in this area.

However, in order to minimize the data gap, three different methods were applied within the framework of this study. These methods contributed to obtaining data from various sources and increasing the depth of the study. On the other hand, the existence of many potential factors affecting the readiness for the electronic voting system makes it difficult to fully cover the factors that could affect the results of the study. Within the framework of this study, only some of the main factors were analyzed within the limited time and resources. Conducting more extensive analyses on the full implementation of electronic voting can be considered a priority for future research. However, the limited data base and the limited research framework require some claims to be made with more caution. As a result, the limitations and obstacles encountered during the conduct of this study were taken into account, both methodologically and practically, and solutions were presented as effectively

as possible. This approach, in addition to ensuring the reliability of the study, will prepare the ground for further research on the topic in the future.

4. Result

A qualitative and data collection approach was applied to investigate the readiness of Azerbaijani citizens and the government for electronic voting. Interviews were conducted with experts related to the topic, as well as references to information and reports related to the topic. Key indicators and criteria were determined to find answers to the research question and sub-research questions, and a research process was conducted accordingly.

One of the key indicators in assessing the readiness of Azerbaijani citizens for electronic voting from a citizen perspective was technological readiness, and technological readiness was determined based on 3 criteria (access to the Internet, access to a digital device, and digital skills). According to the experts, serious results have been achieved in Azerbaijan on the technological readiness indicator, but there are some shortcomings. Thus, differences in age (young and older generation) and location (rural and urban) categories are relevant, which may affect the process. The statistical report on technological readiness confirms this fact. Thus, the Azerbaijan Digital Development report shows that there are shortcomings in technological readiness mainly in the older generation and rural areas of Azerbaijan. Therefore, it is appropriate to assess Azerbaijan's readiness for electronic voting from a citizen perspective as partially ready from a technological perspective. Another important factor from the perspective of citizen readiness for electronic voting is social readiness, which is based on citizens' trust in the electronic system. Based on the questions addressed to the interviewees, some interviewees stated that there are shortcomings in the direction of social readiness, while others believe that citizens in Azerbaijan have confidence in electronic services. Since there are no figures to assess citizens' trust in electronic systems and social trust is a relative concept, it is difficult to express specific opinions. Although, according to experts, it is possible to assess the social readiness indicator as partially ready, a comprehensive analysis is needed on this indicator.

Legal, political and IT infrastructure were considered as the main indicators in assessing the readiness of Azerbaijani citizens for electronic voting from the government perspective. According to experts, certain steps have been taken in the legal framework regarding the readiness of the Azerbaijani government for electronic voting. Thus, the formation of the legal framework in the direction of the electronicization policy by the government in recent times is positively assessed by experts. However, the need to improve the legal framework is emphasized if electronic voting is to be implemented. The findings on legal preparedness confirm the opinions of the interviewees. Thus, the

Azerbaijani government has adopted many legislative acts in the direction of electronic services, personal data protection, and the development of electronic management mechanisms, and work has been done to form a legal framework in this direction. However, if electronic voting is to be implemented, the necessary changes will also need to be made to the Election Code. Based on expert opinions and findings, it is possible to assess the readiness of the Azerbaijani government for electronic voting from a legal perspective as partially ready.

In the assessment of the political readiness of Azerbaijan by the government, discussions related to the topic of political stability were taken as the main indicator. According to experts, Azerbaijan is assessed as a politically unstable and unstable country. According to experts, there is a need to improve democratic institutions, and given that electronic voting is a political prerequisite, there is no or only a partially favorable political environment for the implementation of electronic voting. The findings confirm this fact. According to the Stability of Democratic Institutions Index, Azerbaijan is rated 2 out of 10 (2024). According to the SAARC Country Political Stability Index, Azerbaijan ranks 180th out of 214 (2022). In the context of political readiness for electronic voting, discussions related to the topic were also taken as a criterion. In recent years, there have been many discussions on the Azerbaijani agenda related to electronic voting, and plans for the implementation of electronic voting have been announced by deputies of the Milli Majlis and officials of the Central Election Commission of the Republic of Azerbaijan. Based on expert opinions and findings, it can be noted that Azerbaijan needs to make serious reforms in the context of political readiness for electronic voting, and the level of readiness can be described as not ready or partially ready.

According to the experts' opinions on the readiness of the Azerbaijani government from the perspective of IT infrastructure, there is progress in this direction and it can currently be considered stable for a mass service such as electronic voting, but it is undeniable that there will be certain difficulties. Experts assess Azerbaijan as ready or partially ready in terms of IT infrastructure. The findings related to the criteria coincide to some extent with the experts' opinions. Azerbaijan ranks 74th (2024) on the E-Government Development Index, 93rd (2024) on the Global Innovation Index, and 50th (2024) on the National Cyber Security Index. It is also worth noting the steps taken by the Azerbaijani government in its digitization policy. The development and implementation of local digital products such as "SIMA", "mygov" and "AsanBridge" throughout the country are the result of the work done in this area. In general, if we summarize the expert opinions and findings, it is possible to assess the readiness of the Azerbaijani government for electronic voting as ready or partially ready.

5. Conclusion

The research aimed to determine the readiness of Azerbaijani citizens and the Azerbaijani government for electronic voting. The readiness of Azerbaijani citizens for electronic voting was examined from a technological and social perspective, and the readiness of the Azerbaijani government for electronic voting was examined from a legal, political and IT infrastructure perspective. The author consulted literature on the topic, studied the concept of electronic government, the concept of electronic voting, the concept of readiness and the experiences of other countries with electronic voting. The author determined indicators and criteria for measuring them based on the used literature. A qualitative approach and data collection methods were used to find answers to the research question and sub-research questions. An analysis of indicators and criteria was conducted based on experts' opinions and findings regarding the topic.

The study determined that to assess the preparedness of Azerbaijani citizens for electronic voting, they must possess Internet access, digital device access, the ability to use digital tools, and confidence in electronic services from the citizen's perspective. From the government's perspective, the implementation of electronic voting necessitates the presence of a legislative framework, a stable political environment, and IT infrastructure. According to the analysis, Azerbaijani citizens can be considered partially ready for electronic voting from a technological and social standpoint. There is a need to collect more information on determining social readiness. The legal readiness of the Azerbaijani government for electronic voting can be assessed as partially ready. Similarly, the government's IT infrastructure can be considered partially or ready. The government assesses Azerbaijan's political readiness as either not ready or partially ready and suggests serious reforms in this area.

The results suggest that both citizens and the state face shortcomings in implementing electronic voting in Azerbaijan. The research results indicate that the primary challenges in implementing electronic voting in Azerbaijan stem from a lack of technological readiness across the entire country. Specifically, the older generation lacks widespread Internet access, and rural areas lack full access to digital resources such as the Internet and devices. Expert opinions suggest that citizens harbor partial distrust towards electronic services. From a state perspective, there are serious shortcomings in IT infrastructure and legal aspects, as well as in political terms. The mentioned shortcomings create potential risks for the implementation of electronic voting. The author suggests using the electronic voting option in parallel, without completely eliminating the traditional voting process, as a pilot project during the initial stage of electronic voting in Azerbaijan. Implementing one

of these approaches will allow for a small-scale test of the system's functionality, reliability, possible technical and organizational problems, potential risks, and citizen and government response. It is also worth noting that the introduction of electronic voting in Azerbaijan can contribute not only to the electoral process but also to the development of e-government and create habits for citizens to acquire digital skills.

Also, from the government's point of view, it is important to implement political reforms, establish and promote political institutions, and ensure political stability. As mentioned earlier, it is important to encrypt voter data in the electronic voting mechanism and protect privacy by electronic means. Without political stability in the country, citizens may be suspicious about the protection of the privacy of their data. Also, even if a legal framework for electronic voting is created, without political stability, the correct application of the law is doubtful. The formation of political stability can make a very serious contribution to the process. One issue that needs to be taken into account is that if the digitization policy was previously a choice, it has now become a necessity, integrated into every aspect of our lives, and is currently a tool that changes the lifestyle of society. It can be assumed that the acceleration of the digitization policy will also have an impact on all processes, including the electronification of elections. Digitalization creates transparency and accountability on a large scale. From this point of view, it can be considered that digitalization is also capable of affecting the political and legal spheres. The implementation of electronic voting in elections can serve as a preliminary measure for enacting political reforms in Azerbaijan. The literature indicates that digitalization enhances transparency and accountability. The option of initiating political reforms through the implementation of electronic voting, alongside the regulation of political stability, is a viable consideration.

Furthermore, it's crucial to remember that this study served as a component of a master's thesis. One of the main challenges in researching the topic was the lack of country-specific data. This lack of data made it difficult to conduct extensive data-based empirical analyses. While the study's results provide an initial understanding of the topic, further extensive and in-depth research is necessary in this area. It is expected that future studies will provide new perspectives in both theoretical and practical aspects and further enrich the existing scientific base. This scientific work will also provide an impetus for further research.

References

- A. Prosser and R. Krimmer. (2004). The Dimensions of Electronic Voting Technology, Law, Politics and Society. Electronic voting in Europe, (p. 25). Retrieved from https://www.researchgate.net/publication/275098105_The_Dimensions_of_Electronic_Voting_Technology_Law_Politics_and_Society
- Aghabayli, A. (2023). Internet voting in Azerbaijan: Possible implementation, challenges, and potential (Master's thesis, Tallinn University of Technology, Tallinn, Estonia). Retrieved from <https://digikogu.taltech.ee/et/Download/9250acc-9530-407b-a087-9a405d5669c9>
- Ahmad, A. (2020). Sharg. Retrieved from <https://sherg.az/siyaset/119539>
- Ajzen, I. (1991). The Theory of Planned Behavior. In *Organizational Behavior and Human Decision Processes* (pp. 179-211). doi:10.1016/0749-5978(91)90020-T
- Albuquerque, Baptista, and Fernando. (2016). Determinants of E-voting Adoption: Evidence from Brazil. *Government Information Quarterly*, 385-393.
- Alexander H. T, Vasyl V. K and Frederico S. (2016). Potential and challenges of E-Voting in the European Union. European Parliament, Citizens' Rights and Constitutional Affairs. Retrieved from https://www.europarl.europa.eu/RegData/etudes/STUD/2016/556948/IPOL_STU%282016%29556948_EN.pdf
- Alvarez, R. M., Hall, T. E., & Trechsel, A. H. (2009). Internet Voting in Comparative Perspective: The Case of Estonia. *PS: Political Science & Politics*, 42(3), 497–505. doi:10.1017/S1049096509090787
- Appel A. W., Is Internet Voting Trustworthy? The Science and the Policy Battles, 21 U.N.H. L. Rev. 523 (2023). Retrieved from https://scholars.unh.edu/unh_lr/vol21/iss2/9/
- Arkhurst, P. (2005). The utilization of e-government services: citizen trust, innovation and acceptance factors. *Information Systems Journal*, 5-25. Retrieved from https://www.academia.edu/507538/The_utilization_of_e_government_services_citizen_trust_innovation_and_acceptance_factors_

- Avgerou, C. (2013). Explaining Trust in IT-Mediated Elections: A Case Study of E-Voting in Brazil. *Journal of the Association for Information Systems*, 420-451.
doi:10.17705/1jais.00340
- Azertag. (2010). E-voting to be used at parliamentary elections in Azerbaijan. Retrieved from https://azertag.az/en/xeber/e_voting_to_be_used_at_parliamentary_elections_in_Azerbaijan-598643
- Babayev, V. (2016). E-Voting: Challenges and Opportunities for Electoral Management in Azerbaijan. *Central Asia and the Caucasus*, 118-125.
- Babayeva, C. (2021). Report. Retrieved from <https://report.az/daxili-siyaset/azerbaycanda-elektron-sesvermenin-tetbiqi-nezerde-tutulur/>
- Babayeva, J. (2018). No need for e-voting: Azerbaijani Central Election Commission. Baku: Trend Agency. Retrieved from <https://en.trend.az/azerbaijan/politics/1394353.html>
- Baeuo, M. O. M., Rahim, N. Z. B. A., & Alaraibi, A. a. M. (2016). Technology Aspects of E-Government Readiness in Developing Countries: A Review of the literature. *Computer and Information Science*, 9(4), Retrieved from <https://doi.org/10.5539/cis.v9n4p1>
- Bélangier, F., Hiller, J. & Smith, W. (2002). Trustworthiness in electronic commerce: the role of privacy, security, and site attributes. *Journal of Strategic Information Systems*, 240-275.
doi:10.1016/S0963-8687(02)00018-5
- Best Solutions. (2018, March). Azerbaijan has become the first country to implement the prototype of Estonian X-Road platform in e-government system. Retrieved from <https://bestsolutions.ee/2018/03/azerbaijan-has-become-the-first-country-to-implement-the-prototype-of-estonian-x-road-platform-in-e-government-system/>
- Borucki Isabelle, Hartleb Florian, 2023, Debating E-voting throughout Europe: constitutional structures, parties' concepts and Europeans' perceptions, *Frontiers in Political Science*, Vol 5, Retrieved from <https://www.frontiersin.org/journals/politicalscience/articles/10.3389/fpos.2023.982558>
- Bruter, M. and Harrison, S. (2017), 'Understanding the Emotional Act of Voting'. *Nature human behavior*

- Bryan S. and Dan G. J.D. (2013). Establishing a Legal Framework for E-Voting in Canada. Retrieved from https://www.elections.ca/res/rec/tech/elfec/pdf/elfec_e.pdf
- Darmawan, I. (2021). E-voting adoption in many countries: A literature review. *Asian Journal of Comparative Politics*, 6(4), 482-504. <https://doi.org/10.1177/20578911211040584>
- Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319. doi: 10.2307/249008
- Davis, F.D. (1986) A Technology Acceptance Model for Empirically Testing New EndUser Information Systems: Theory and Results. Sloan School of Management, Massachusetts Institute of Technology. Retrieved from <http://dspace.mit.edu/bitstream/handle/1721.1/15192>
- Deth, J. W. (2021). What Is Political Participation? In *Oxford Research Encyclopedia of Politics* (pp. 1-17). doi:10.1093/acrefore/9780190228637.013.68
- Dhane, S. D., & Rathod, S. B. (2022). Recent online voting systems: Study & comparative analysis. Retrieved from <https://ijcrt.org/papers/IJCRT2204009.pdf>
- Drechsler, W., Madise, Ü. (2004). Electronic Voting in Estonia. In: Kersting, N., Baldersheim, H. (eds) *Electronic Voting and Democracy*. Palgrave Macmillan, London. https://doi.org/10.1057/9780230523531_6
- Duenas-Cid, D., Krivososova, I., Serrano, R., Freire, M., & Krimmer, R. (2020). Tripped at the Finishing Line: The Aland Islands Internet Voting Project. *Fifth International Joint Conference on Electronic Voting*, (pp. 64-79).
- Dzhusupova, Z., Shareef, M., Ojo, A., & Janowski, T. (2010). Methodology for e-government readiness assessment: models, instruments and implementation. Retrieved from <https://www.semanticscholar.org/paper/Methodology-for-e-government-readiness-assessment%3A-Dzhusupova-Shareef/d6af1b431c8557e638319ba836a16c0d0cfed836>
- E. Aljarrah, H. Elrehail and B. Aababneh. (2016). E-voting in Jordan: Assessing readiness and developing a system. In *Computers in Human Behavior* (pp. 860-867). doi: <https://doi.org/10.1016/j.chb.2016.05.076>
- Election Infrastructure Cyber Risk Assessment. (2020). Agency Cybersecurity and Infrastructure Security, p-5. Retrieved from https://www.cisa.gov/sites/default/files/publications/cisa-election-infrastructure-cyber-risk-assessment_508.pdf

- Fedorov, Alexander & Levitskaya, Anastasia. (2020). Typology and Mechanisms of Media Manipulation. *International Journal of Media and Information Literacy*. 5. doi:10.13187/ijmil.2020.1.69.
- Fouad.S. (2016). The Main Factors Affecting E-voting Service Implementation: The Case of Palestine. 25th International Conference on Information System Development, (p. 10). Retrieved from http://aisel.aisnet.org/isd2014/proceedings2016/CreativitySupport/10Fs8OCCjV9M&redir_esc=y#v=snippet&q=Chapter%20XVII&f=false
- Freedom House. (2024). Azerbaijan: Freedom in the World 2024 Country Report. Retrieved from <https://freedomhouse.org/country/azerbaijan/freedom-world/2024>
- G. Laskaridis, K. Markellos, P. Markellou, A. Panayiotaki, A. Tsakalidis. (2008). E-Government's Barriers and Opportunities in Greece. In *Public Information Technology* (pp. 175-191). Retrieved from <https://books.google.az/books?hl=tr&lr=&id=b7JxWN24unIC&oi=fnd&pg=PP1&dq=10.4018/978-1-599048574&ots=yQF6cEqeZE&sig=jHKpZJ2rqdgCGhPkd>
- G.O. Ofori-Dwumfuo and E. Paatey. (2011). The Design of an Electronic Voting System. *Research Journal of Information Technology*, 91-98.
- Hailu, M. (2020). Readiness Assessment for Implementing E-Voting System in Ethiopia: a Gap Analysis From Supply Side. Retrieved from <http://etd.aau.edu.et/handle/123456789/22571>
- Hendrik Scholta, Willem Mertens, Marek Kowalkiewicz, Jörg Becker. (2019). From one-stop shop to no-stop shop: An e-government stage model. *Government Information Quarterly*. p-12. doi:<https://doi.org/10.1016/j.giq.2018.11.010>
- Hendrik Scholta, Willem Mertens, Marek Kowalkiewicz, Jörg Becker. (2019). From one-stop shop to no-stop shop: An e-government stage model. *Government Information Quarterly*. p-12. doi:[10.1016/j.giq.2018.11.010](https://doi.org/10.1016/j.giq.2018.11.010)
- Hoque, M. M. (2014). A Simplified Electronic Voting Machine System. *International Journal of Advanced Science and Technology*, pp 97-98. doi:10.14257/ijast.2014.62.07
- Innovation and Digital Development Agency, (2024) Retrieved from : idda.az/az/page/haqqimizda
- International Foundation for Electoral Systems. (2025). ElectionGuide: Azerbaijan. Retrieved from <https://www.electionguide.org/countries/id/16/>

- International Institute for Democracy and Electoral Assistance (IDEA). (2011). Introducing electronic voting: Essential considerations. Stockholm: International IDEA. Retrieved from <https://www.idea.int/publications/catalogue/introducing-electronic-voting-essential-considerations>
- International Institute for Democracy and Electoral Assistance (IDEA). (2023). Use of e-voting around the world. Retrieved from <https://www.idea.int/news-media/multimedia-reports/use-e-voting-around-world>
- International Telecommunication Union. (2024). Global Cybersecurity Index 2024. Retrieved from https://www.itu.int/en/ITU-D/Cybersecurity/Documents/GCIv5/2401416_1b_Global-Cybersecurity-Index-E.pdf
- Ismail, H. A. (2008). Citizens' Readiness for E-government in Developing Countries. Middlesex University. Retrieved from <https://eprints.mdx.ac.uk/7998/1/Ismail-phd.pdf>
- Karimova, A. (2015). Azerbaijan can launch e-voting system. AzerNews. Retrieved from <https://www.azernews.az/nation/88644.html>
- Karimova, A. (2015). Azerbaijan can launch e-voting system. AzerNews. Retrieved from <https://www.azernews.az/nation/88644.html>
- Khazar News (2021). Will electronic voting be implemented in Azerbaijan?. Retrieved from <https://www.xezerxeber.az/news/cemiyyet/346587/azerbaycanda-elektron-sesverme-tetbiq-olunacaq>
- Krimmer, R. (2012). The Evolution of E-voting: Why Voting Technology is Used and How it Affects Democracy. Retrieved from <https://www.researchgate.net/publication/236216941>
- Leets, P. (2021). Multi-dimensionality of trust towards e-voting. Sixth International Joint Conference on Electronic Voting, (pp. 387-388). Retrieved from https://www.researchgate.net/publication/355107346_Sixth_International_Joint_Conference_on_Electronic_Voting_E-Vote-ID_2021_-_Proceedings
- Leogrande, A. (2024). The Global Innovation Index. Zenodo. <https://doi.org/10.5281/ZENODO.13142578>
- Lisa S.Y, Mohamad S and Utami N. (2022). Readiness of E-Voting in Welcoming E-Democracy: An Analysis of Mass Media. The 2nd International Conference Sociology, (pp. 293-302).

- Lust, A. (2018). I-Vote, Therefore I Am? Internet Voting in Switzerland and Estonia. *The SAIS Review of International Affairs*, 38(1), 65–79. <https://www.jstor.org/stable/27001472>
- M. Germann, F. Conradin, C. Wellig and U. Serdult.” Five Years of Internet Voting for Swiss Expatriates” in *CeDEM14, Conference for eDemocracy and Open Government*, 21-23 May 2014, P. Parycek and N. Edelmann, ed. Krems: Danube University Krems, 2014, pp. 127-140
- M. Hapsara, A. Imran and T. Turner. (2017). Beyond Organizational Motives of e-Government Adoption: The Case of e-Voting Initiative in Indonesian Villages. *4th Information Systems International Conference* (pp. 362–369). *Procedia Computer Science*. doi.org/10.1016/j.procs.2017.12.166
- Maaten, E. (2004). Towards remote e-voting: Estonian case. In *Electronic voting in Europe Technology, law, politics and society*, workshop of the ESF TED programme together with GI and OCG. Gesellschaft für Informatik eV.
- Manik, H. (2013). E-Voting Indonesia: A Safety-Critical-Systems model towards standard and framework for Indonesia’s Presidential Election. *Australian Journal of Basic and Applied Sciences*, 301-308.
- Merino, L.-H. (2023). *Electronic Voting*. Springer. doi:https://doi.org/10.1007/978-3-031-33386-6_23
- Ministry of Communications and Information Technologies of the Republic of Azerbaijan. (2023). *Statistical yearbook*. <https://mincom.gov.az/storage/Statistika-kitab-ENG.pdf>
- Ministry of Digital Development and Transport of the Republic of Azerbaijan (2023). List of all e-services. Retrieved from <https://www.e-gov.az/en/services>
- Mitrou, L. (2004). *Electronic voting observatory*. Retrieved from https://www.icsd.aegean.gr/website_files/metapyxiako/65983061.pdf
- Mitrou, Lilian & Gritzalis, Dimitris & Katsikas, Sokratis & Quirchmayr, Gerald. (2003). *Electronic Voting: Constitutional and Legal Requirements, and Their Technical Implications*. 10.1007/978-1-4615-0239-5_4.

- N. Mpekoa and D. van Greunen, "E-voting experiences: A case of Namibia and Estonia," 2017 IST-Africa Week Conference (IST-Africa), Windhoek, Namibia, 2017, pp. 1-8, doi: 10.23919/ISTAFRICA.2017.8102303
- Nasution, Rusnandi, Qodariah. (2018). The Evaluation of Digital Readiness Concept: Existing Models and Future Directions. *The Asian Journal of Technology Management*, 94-117. doi:10.12695/ajtm.2018.11.2.3
- National Cyber Security Index. (2024). Retrieved from <https://ncsi.ega.ee/country/az/>
- National Democratic Institute. (2013). Retrieved from <https://www.ndi.org/e-voting-guide/internet-voting>
- Neudert, L. and Marchal, N. (2019). Polarisation and the use of technology in political campaigns and communication. European Parliamentary Research Service. Retrieved from <https://data.europa.eu/doi/10.2861/167110>
- Nu'man, A. (2012). A framework for adopting e-voting in Jordan. *Electronic Journal of e-Government*, 10(2), 160–177.
- OECD. (2019). Towards people-centric public services. In *Government at a Glance* (pp. 27-28). OECD Publishing. doi:<https://doi.org/10.1787/8ccf5c38-en>
- On improving governance in the field of e-government. (2021). Ministry of Justice of the Republic of Azerbaijan Unified electronic database of legal acts. Retrieved from <https://e-qanun.az/framework/57220>
- Organization United Nations Industrial Development. (2023). Development of an innovation system and its support infrastructure in Azerbaijan. Retrieved from https://hub.unido.org/sites/default/files/publications/Development%20of%20Innovation%20system_Azerbaijan_0.pdf
- Othman, M., & Razali, R. (2013). Key contributing factors towards successful Electronic Government systems interoperability. Paper presented at International Conference on Research and Innovation in Information Systems (ICRIIS), 302-307. IEEE. Retrieved from <http://dx.doi.org/10.1109/ICRIIS.2013.6716726>
- Our World in Data. (2024) Stability of democratic institutions index (BTI). Retrieved from <https://ourworldindata.org/grapher/stability-democratic-institutions-index-bti>

- P. Sciarini, F. Cappelletti, A. Goldberg, A. Nai and A. Tawfik, "Etude' du vote par internet dans le canton de Geneve. Rapport final ` a l'intention ` de la Commission externe d'evaluation des politiques publiques", Departement de science politique et relations internationales, Universit'e' de Geneve, 2013.
- P. Wolf, R. Nackerdien and D. Tuccinardi. (2011). Introducing Electronic Voting: Essential Considerations. Policy Paper. Retrieved from <https://www.eods.eu/library/IDEA.Introducing-Electronic-Voting-Essential-Considerations.pdf>
- Paralel. (2024). Retrieved from <https://paralel.az/az/article/492261>
- Paul S. H, Richard G. N, Michael J. H and Peter L. F. (2008). Voters' Evaluations of Electronic Voting Systems. In American Politics Research (pp. 580-611). doi:10.1177/1532673X08316667
- Piret Ehin, Mihkel Solvak, Jan Willemsen, Priit Vinkel, (2022) Internet voting in Estonia 2005–2019: Evidence from eleven elections, Government Information Quarterly, Volume 39, Issue 4, 2022, 101718, ISSN 0740-624X Retrieved from <https://doi.org/10.1016/j.giq.2022.101718>.
- R. Krimmer and R. Schuster. (2008). The E-Voting Readiness Index. Electronic Voting Conference, (pp. 127-136).
- Report.az. (2023). "ASAN Bridge". Retrieved from <https://report.az/ikt/sedr-muavini-asan-bridge-e-52-dovlet-qurumu-integrasiya-olunub/>
- Risnanto, S. (2019). Preparatory Component For Adoption E- Voting. doi: 10.1109/TSSA48701.2019.8985461
- S. Risnanto, Y.B.A. Rahim, N.S.Herman and Abdurrohman. (2020). E-voting Readiness Mapping For General Election Implementation. Journal of Theoretical and Applied Information Technology, 3288. Retrieved from <https://www.jatit.org/volumes/Vol98No20/>
- S.A.Adeshina and A.Ojo. (2017). Factors for e-voting adoption - analysis of general elections in Nigeria. Government Information Quarterly. doi:10.1016/j.giq.2017.09.006
- Saini, Michael & Shlonsky, Aron. (2012). Systematic Synthesis of Qualitative Research. doi.org/10.1093/acprof:oso/9780195387216.001.0001.

- Sirait, E., Zuiderwijk, A., & Janssen, M. (2024). The readiness of the public sector to implement AI: a Government-Specific framework. In *Lecture notes in computer science* (pp. 302–316). https://doi.org/10.1007/978-3-031-70274-7_19
- Sirendi, R., Mendoza, A., Barrier, M., Taveter, K., and Sterling, L. (2018). A conceptual framework for effective appropriation of proactive public e-services. *Proceedings of the 18th European Conference on Digital Government*, 213-221.
- Solvak M. & Vassil K. (2016). *E-voting in Estonia: Technological diffusion and other developments over ten years (2005–2015)*. Tartu: Johan Skytte Institute of Political Studies, University of Tartu. Retrieved from <https://www.digar.ee/arhiiv/en/books/62510>
- Stenbro, M. (2010). *A Survey of Modern Electronic Voting*. p-30. Retrieved from <https://cdn.www.gob.pe/uploads/document/file/6078595/5381299-a-survey-of-modern-electronic-voting-technologies.pdf>
- Strategic Roadmap for the Development of Telecommunications and Information Technologies in the Republic of Azerbaijan. (2016). Ministry of Justice of the Republic of Azerbaijan Unified electronic database of legal acts. Retrieved from <https://e-qanun.az/framework/57132>
- "Study on E-Voting practices in the EU". European Commission. 2023. Retrieved from https://commission.europa.eu/document/download/23076478-987e-4dea-b9ef-df5e0dfd6cd2_en?filename=DG_JUST_EVoting_Report_pdf.pdf
- T. Christin and A. H. Trechsel, "Analyse du scrutin du 26 septembre 2004 dans quatre communes genevoises (Anieres, Carouge, Cologny et Meyrin)," *E-Democracy Center, Universite de Geneve*, 2005
- T.Hajiyev. (2010). E-voting which was introduced for the first time in parliamentary elections in Azerbaijan was successful. *Trend*. Retrieved from <https://en.trend.az/azerbaijan/politics/1778850.html>
- Taiwo, R. (2015). Cyber Behavior. In *Encyclopedia of Information Science and Technology*, Third Edition (p. 2980). Information Resources Management Association. Retrieved from https://www.academia.edu/14655794/Cyber_Behavior

- The Republic of Azerbaijan. (2023). Model Statute of State Information Resources and Systems. e-Qanun. <https://e-qanun.az/framework/58154>
- Trechsel, A. H., Schwerdt, G., Breuer, F., Alvarez, M., & Hall, T. (2007). Report for the council of Europe: Internet voting in the March 2007 Parliamentary elections in Estonia. Strasbourg: Council of Europe.
- U. Serdult and A. H. Trechsel, "Umfrage bei Stimmberechtigten " der Zurer Gemeinden Bertschikon, B " ulach und Schlieren anl " asslich " des Pilotversuchs zum Vote electronique vom 27. November 2005," ' Bundeskanzlei: Sektion Politische Rechte, Bern, 2006, pp. 331-380
- U. Serdult, "Internet voting for the Swiss abroad of Geneva: First only "survey results", in Electronic government and electronic participation: joint proceedings of online research and projects of IFIP EGOV and ePart 2010, J-L. Chappelet, ed. Linz: Trauner Verlag, 2010, pp. 319-325
- U. Serdult, M. Germann, F. Mendez, A. Portenier and C. Wellig, "Fifteen years of internet voting in Switzerland: History, Governance and Use," Published in 2015 Second International Conference on eDemocracy \& eGovernment (ICEDEG), Quito, Ecuador, 2015, pp. 126-132, doi: 10.1109/ICEDEG.2015.7114482. Retrieved from <https://doi.ieeecomputersociety.org/10.1109/ICEDEG.2015.7114482>
- UN E-Government Survey. (2024). Retrieved from <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/11-Azerbaijan>
- United Nations. (2012). E-government development index. CESifo DICE Report, 4(4), 71. Retrieved from <https://www.ifo.de/DocDL/dicereport412-db2.pdf>
- United Nations. (2012). E-government development index. CESifo DICE Report, 4(4), 71. Retrieved from <https://www.ifo.de/DocDL/dicereport412-db2.pdf>
- V. Venkatesh, J. Y. L. Thong and X. Xu. (2016). Unified Theory of Acceptance and Use of Technology: A Synthesis and the Road Ahead. Journal of the Association for Information Systems, 328–376. doi:DOI:10.17705/1jais.00428

- Venkatesh, V., Morris. M. G., Davis.G., and Davis. F. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 425-478.
doi:<https://doi.org/10.2307/30036540>
- Venkatesh. V and Davis. F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. In *Management Science* (pp. 186-204).
doi:<http://dx.doi.org/10.1287/mnsc.46.2.186.11926>
- Vladislav, F. (2021). Public opinion about electronic voting in Europe as illustrated by YouTube. *Przegląd Europejski*, P-132. doi:<https://doi.org/10.31338/1641-2478pe.4.21.8>
- What is e-voting? Who's using it and is it safe?, (2024)World Economic Forum. Retrieved from <https://www.weforum.org/stories/2024/04/what-is-electronic-voting/>
- Will electronic voting be implemented in Azerbaijan? (2021). *Khazar News*. Retrieved from <https://www.xezerxeber.az/news/cemiyet/346587/azerbaycanda-elektron-sesverme-tetbiq-olunacaq>
- World Bank. (2022). SAARC country political stability index. Retrieved from <https://databank.worldbank.org/embed/SAARC-Country-Political-Stability-Index/id/6282cd19>
- What is e-Government and why it is important? (2019). Gräbner-Omahna IT Consutling. Retrieved from <https://www.ao-itc.de/what-is-e-government-and-why-it-is-important//14927137MIT.pdf;jsessionid=7C01E55731770C479C1ED51AEFF6CE46?sequence=16Vol98No20.pdf>
- Zhang, N., & Hou, X. (2011). Government Process Management under electronic government and its application. Paper presented at International Conference on E-Business and E-Government (ICEE), 1-4. IEEE. Retrieved from <http://dx.doi.org/10.1109/ICEBEG.2011.5881951>