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Faculty of Economics and Management

Department of Information Technologies

Bachelor Thesis

E-government development in Kyrgyzstan

Amankulova Sabina

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

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Sabina Amankulova

Economics and Management

Thesis title

E-government development in Kyrgyzstan

Objectives of thesis

The thesis investigates e-Government in Kyrgyzstan. The main goal is to analyze the development challenges faced by Kyrgyzstan in attempts to use modern information and communication technology tools for improving public services.
The partial goals are:
• to make an overview of barriers and enablers for implementing effective e-Government;
• to analyze certain e-Government services in Kyrgyzstan;
• to make a comparative analysis of e-Government between Kyrgyzstan and neighboring countries;
• to interpret result and formulate conclusions.

Methodology

The theoretical part of the thesis will be based on the study of professional materials, legislation and the description of the current state. The practical part of the work will be focused on the analysis of the available data of departmental organizations. By generalizing and deducing knowledge from the theoretical and practical parts of the work, recommendations and conclusions will be formulated.

The proposed extent of the thesis

40-50 pages

Keywords

E-government(eGovernment), Kyrgyzstan, Central Asia, eDemocracy, information society

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Recommended information sources

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The Bachelor Thesis Supervisor

Ing. Miloš Ulman, Ph.D.

Supervising department

Department of Information Technologies

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doc. Ing. Jiří Vaněk, Ph.D.

Head of department

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Ing. Martin Pelikán, Ph.D.

Dean

Prague on 03. 03. 2022

Declaration

I declare that I have worked on my bachelor thesis titled "E-government development in Kyrgyzstan" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on 15.03.2022 _____

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E-government development in Kyrgyzstan

Abstract

The thesis' major goal is to figure out where Kyrgyzstan stands in terms of e-government development. The theoretical chapter will explore the key terms, definitions, and concepts of e-government, as well as the history of its growth, socioeconomic and political landscape, e-government barriers, and future expectations.

The practical section compares e-government of Kyrgyzstan with that of Russia and Kazakhstan, which are both geographically and socioeconomically near to Kyrgyzstan. It also examines a specific online e-government service, the electronic issue of COVID-19 vaccination certificates. A survey using a combination of convenience sample and snowball sampling techniques was performed. A SWOT analysis of the adoption of e-government technologies in Kyrgyzstan is included in the final section of the practical section.

Based on both theoretical and practical parts, the thesis concludes with recommendations and suggestions for the deployment and long-term sustainability of e-government instruments. This thesis draws on both primary and secondary sources.

Keywords: E-government (eGovernment), E-government project, Kyrgyzstan, Central Asia, information society, ICT technologies.

Rozvoj E-governmentu v Kyrgyzstánu

Abstrakt

Hlavním cílem práce je zjistit, kde si Kyrgyzstán stojí z hlediska rozvoje e-governmentu. Teoretická kapitola bude zkoumat klíčové pojmy, definice a koncepty e-governmentu, stejně jako historii jeho růstu, socioekonomické a politické prostředí, bariéry a budoucí očekávání.

Praktická část porovnává e-government Kyrgyzstánu s Ruskem a Kazachstánem, které jsou jak geograficky, tak socioekonomicky blízké Kyrgyzstánu. Zkoumá také konkrétní online službu elektronické veřejné správy - elektronické vydávání očkovacích certifikátů proti COVID-19. Byl proveden průzkum využívající kombinaci technik vhodnosti vzorku a sněhové koule. V závěrečné části praktické části je zahrnuta SWOT analýza zavádění technologií e-governmentu v Kyrgyzstánu.

Na základě teoretické i praktické části práce uzavírá doporučení a návrhy pro nasazení a dlouhodobou udržitelnost nástrojů e-governmentu. Při zpracování této práce autor používal primární a sekundární zdroje.

Klíčová slova: E-government (eGovernment), E-government projekt, Kyrgyzstán, Střední Asie, eDemokracie, informační společnost, ICT technologie.

Table of content

1 Introduction 10

2 Objectives and Methodology 11

2.1 Objectives 11

2.2 Methodology 11

3 Theoretical part 12

3.1 Information society 12

3.2 E-government 14

3.3 Kyrgyzstan from the economic and socio-political perspective 16

3.3.1 E-government in Kyrgyzstan 18

3.3.2 Current state of implementation of the e-government strategy 21

3.4 Barriers of E-government development and future expectations 22

3.4.1 E-government paradox 23

4 Practical Part 25

4.1 A comparative analysis of e-Government 25

4.1.1 Electronic COVID19 vaccination certificates 30

4.2 Survey 34

4.2.1 Chi-squared test 36

4.3 SWOT Analysis 38

5 Results and discussion 41

6 Conclusion 43

7 References 44

8 Appendix 48

List of figures

Figure 1 - Certificate of COVID-19 vaccination in the Kyrgyz Republic 31
Figure 2 - Electronic certificate of COVID-19 vaccination in the Kyrgyz Republic 32

List of graphs

Graph 1 - Global rankings of countries 29
Graph 2 - Age..... 34
Graph 3 - Vaccination status..... 35
Graph 4 - Use of online government tool..... 35

List of tables

Table 1 Planned results of digital development in countries 27
Table 2 Indicators of development of the ICT sphere, 2020 28
Table 3 SWOT analysis..... 38

1 Introduction

The beginning of the XXI century was highlighted by the rapid development of digital technologies caused by the information revolution and the economic globalization. The importance of information in the society and business processes has become crucial. In the hands of people, it becomes a valuable knowledge. Nowadays, socio-economic relations are significantly shifted to the network space.

A key factor of economic and social digital transformation is the development of digital culture. One of the most important areas of economic development now is the integrated implementation of modern digital technologies that will change economic activities, communications, and the social sphere. It will ultimately ensure the formation of a new "digital" economy. In many countries, considerable attention is paid to the formation of a digital society. Currently, great hopes are pinned on the fact that the introduction of new ICTs will improve technological processes and improve product quality, optimize the organization of processes in various industries, and finally, contribute to improving people's health and life quality. The World Bank's 2021 World Development Report lists the following benefits where digital transformation can contribute:

- *greater transparency;*
- *more data on individuals;*
- *production process in firms;*
- *greater accountability;*
- *better policy making and service delivery;*
- *increased business opportunities* (The World Bank Group, 2021)

The purpose of this thesis is to identify trends in the development of e-government in the Kyrgyz Republic and challenges that the government faced while implementing it.

The digital economy is becoming an increasingly important component of the global economy. It offers a myriad of cutting-edge opportunities for inclusive and sustainable development, while posing international and cross-border challenges, the digital divide being the main one.

2 Objectives and Methodology

2.1 Objectives

The thesis investigates e-Government in Kyrgyzstan. The main goal is to analyse the development of e-government and challenges faced by Kyrgyzstan in attempts to use modern information and communication technology tools for improving public services.
The partial goals are:

- to make an overview of barriers and enablers for implementing effective e-Government;
- to analyse certain e-Government services in Kyrgyzstan;
- to make a comparative analysis of e-Government between Kyrgyzstan and neighboring countries;
- to interpret result and formulate conclusions.

2.2 Methodology

The theoretical part of the thesis will be based on the study of professional materials, legislation and other academic works. The practical part of the work will be focused on the analysis of the available data of departmental organizations. By generalizing and deducing knowledge from the theoretical and practical parts of the work, recommendations and conclusions will be formulated.

3 Theoretical part

For the development of any society, material, instrumental, and other resources, including information, have always been necessary. A person interacts with information since birth.

Since ancient times, information was transmitted and stored orally, writing appeared a little later, but in the modern world, thanks to technological progress, new opportunities for transmitting and storing information appear. Various smart gadgets, computers and robotics surround our life. A large number of new professions related to the storage and processing of information have appeared. All this leads to the fact that information becomes a determining resource for the economic development of countries.

3.1 Information society

The information society is a new historical phase of the development of human society, where information and knowledge are given priority.

For the first time, the idea of society's transition to a new stage of development was outlined by the American sociologist Daniel Bell. He defined a new type of society as a post-industrial society, which is characterized by the transition from the production of things to the production of services, changes in the employment of the population and the central role of theoretical knowledge. (Bell, 1976)

Yujiro Hayashi, a professor at the Tokyo Technology University, first introduced the term "*information society*". The basic ideas of the information society are described by the Japanese sociologist Masuda Yoneji, in the "Plan for the Information Society" (also known as plan JACUDI) presented to the Japanese government. (Masuda, 1981)

In the abovementioned document, the information society is considered as "*a society in which the computerization process gives people access to reliable sources of information, relieves them of routine work and ensures a high level of production automation*." (Masuda, 1981)

Alvin Toffler presented the most detailed features of the information society in his work "Third Wave". According to him, the world is entering the third stage of civilization. The basis of the new economic system should be the computer networks connecting private

houses - "electronic cottages" - with industrial organizations, government and educational institutions. (Toffler, 2002)

Thus, modern society formed a social macrocosm laced with global information and telecommunication systems. The demassified media working with specific groups with clearly defined interests and needs play the leading role in the transformation of an industrial society into an information society, according to Toffler. (Toffler, 2002)

Among the theories describing a new type of society, it is worth mentioning the concept of the information society by the American sociologist Manuel Castells, set out in the trilogy "The Information Age: Economy, Society and Culture." Castells defines a new type of society as "informational", thereby stressing the structure-forming role of information. (Castells, 2010)

The concept of the information society is also described by Budiš in the following characteristics (BUDIŠ, 2010):

- significant use of digital processing, storage and transmission of information, that is, high-quality communication, which is the objective basis of fulfilment all relations of human society;
- the use of modern information technologies and digital communications, communication infrastructure, accessibility, technological level and feasibility of the organization are the key factors of the company's development and its economic growth;
- direct participation of political structures in determining the concept of its construction, establishing their progressive goals and principles for their achievement, including the creation of legal, financial and social support for the implementation of this concept.

The concept of the information society is interpreted differently in the works of representatives of the French sociological school, which for the first time considered the information society in a cultural context, not in an economic one, as was the case with their predecessors. The researchers argue that the new type of society functions based on humanistic principles, the principles of universal access to information and democratic decision-making. (Durkheim, 2008)

Despite the recognized contribution that the above mentioned theories have made to the understanding of information in the modern world, they have not been able to avoid criticism. The British sociologist Frank Webster sees the shortcomings of the above

mentioned concepts as they consider information only as a quantitative factor and subject of statistical measurements (more people employed in the information sphere, more media, a greater percentage of GNP, etc.), and the quality side is ignored. (Webster, 1995)

3.2 E-government

One of the tools for developing an information society is E-government. E-government communicates with the state and public management bodies in electronic form and digitalize all the relevant processes. (OECD, 2003)

The term "e-government" is well-established, often used in the legal and academic publications and judicial documents. In the scientific and academic communities, the term appeared as a reaction to the importance of studying the potential of using information and communication technologies (ICT) to solve public administration problems.

In the definition of Organization for Economic Co-operation and Development (OECD), e-government means the use of ICT as a tool to achieve more effective governance. The main goal is to transform management structures, operations and culture with the help of technologies. At the same time, it is emphasized that e-government has the potential to become the main tool for adapting the practice of "*good governance*" (Management, 2002).

At the same time, ideological aspects are often introduced along with technical ones. According to the consulting company Gartner Group, e-government is "*the transformation of internal and external relations of state organizations based on the use of the Internet, information and telecommunication technologies in order to optimize the services provided, increase the level of public participation in public administration and improve internal processes.*" (Grönlund, 2002)

Despite the controversy of the assertion about the democratic nature of e-government, this term emphasizes a very important point: e-government is not limited to the introduction of a global information system, but involves the transformation of the entire system of public administration. One of the main risks in the implementation of e-government is associated with the attempt to automate existing administrative processes. For the successful implementation of projects related to e-government, it is very important to understand that IT acts only as a tool for transforming administrative processes and cannot solve by

themselves the problems the government structures face. Some researchers go further and argue that the most important value of e-government is not in improving efficiency using IT, but in the catalytic effect that it has on the modernization of the administrative apparatus. "*E-government should be seen as a catalyst for modernization of the public service... It is really not about putting all services online*", - says Simas Malconry, a consultant at Accenture. (Irish Times, 2003)

Another definition of e-government is given by the UN:
"*The permanent responsibility of public administration is to improve relations between citizens and the public sector by providing cheap and effective services, information and knowledge. A practical demonstration of the best that public administration can offer*. (Lidinský, 2008)".

The concept of e-government includes an electronic interaction at different levels, such as the relationship between the government and citizens (G2C-government-to-citizen); between the state and entrepreneurs, business companies (G2B-government — to-business); state organizations and their employees (G2E-government — to-employee); and between the government and authorities (G2G-government — to-government). (Evans, 2017)

According to researcher A. Hill (Making government work: Electronic Delivery of Federal Services, 1993), E-government has much more potential than just automating the activities of public authorities. In particular:

- "e-government" enhances the efficiency of public services provided, has a positive social effect due to constant feedback from society-through the participation of citizens, facilitating access to the administration system;
- "e-government" is not so much an expected end result, as a constant factor of modernization, improvement of state structures;
- "e-government" expands the market for free information exchange, as a result of which the management culture and manageability of society are increased;
- "e-government" is a transition from traditional bureaucratic to intelligent, flexible management.

E-government, according to several scholars, has the potential to alter the functioning and interconnections of state institutions at multiple levels. Governments in liberal or developed

countries are willing to pursue such goals, while authoritarian regimes are unlikely to care about boosting transparency and accountability through the implementation of e-government. However, many authoritarian governments, along with rest of the world, have long been developing e-government sites. (Homburg, 2008; Curtin, 2013; Nixon e al. 2010)

3.3 Kyrgyzstan from the economic and socio-political perspective

Kyrgyzstan is a relatively young country, having acquired independence in 1991 after the Soviet Union collapsed. From the outset, Kyrgyzstan was seen as a democratic island in Central Asia, but this reversed in the 1990s under the leadership of the first president, Askar Akayev. During the Tulip Revolution in March 2005, he was ousted from power. International assessments of the country's democratic progress skyrocketed at the time. Kurmanbek Bakiyev was elected as Kyrgyzstan's second president in 2005. His rule resulted in an even larger crisis and deterioration of democracy in the country, and thus the Kyrgyz people deposed him in April 2010. (Cummings, 2013)

The character of the rules and theoretical methods that have been formed in regards to the value system is very accurately reflected in political culture. It is also contradictory in nature, which exacerbates the policy context's complexity in which "*stable layers continue to exist and influence new cultural formations, which allows society to develop without losing its identity*". (Pritchina, 2005)

The new history of Kyrgyzstan begins with the time when the country adopted the Declaration of State Independence of the Kyrgyz Republic in August 1991, which became the independence day of sovereign Kyrgyzstan. The presidential elections of October of that year confirmed the legitimacy of the presidential power.On May 5, 1993, the Constitution of a Sovereign State defined the status of the president, the government, the parliament, and the courts, and also acquired a national currency, which is considered a symbol of statehood. (Cummings, 2013)

In practice, the state has the essential experience to achieve prospective innovative technologies in the future, which involves incorporating effective Western experience into state concepts. Ivanov's work (2006) is a good example of this. "*Globalization processes and their impact on the development of the Kyrgyz Republic*" demonstrates how the flow of international processes is intertwined with the growth of the Kyrgyz Republic. The forces

that support globalization processes are phenomena that affect the life of society, transforming the spiritual appearance of the nation in the process of interaction with the world. (Cummings, 2013)

In search of an effective management model, Kyrgyzstan has frequently appealed to the experience of developed Western countries. Nonetheless, it quickly became evident that developing a new management system without taking into account the unique characteristics of the Kyrgyz mentality would be challenging. Over time, it became clear that any innovations and transformations should be based on people's customs and mentalities, i.e., those social factors that have a significant impact on the formation of the management system, because simply borrowing a management model from another cultural environment and applying it to an existing national model usually results in ineffective management. (Cummings, 2013)

The following are the current significant issues with the functioning of the Kyrgyz Republic's public administration model:

- *inconsistencies between national management practices and those based on other countries' experience;*
- *parochialism and territorialism (tribalism)*
- *corruption*

In general, management concepts developed from the experience of other nations and implemented without taking into consideration native features of social and cultural aspects encounter not only challenges, but also rejection by society. Values and behavioural norms have a protective effect in society because they prevent significant sociocultural changes. This aids the people's efforts to maintain the country's stability and order. As a result, any national management model's foundation is the culture in which it was developed. Any management model is based on societal conditions and established under the influence of the causes that gave origin to the national management model's characteristics. (Cummings, 2013)

A distinct sociology of management model, which is applied in any state, has its own subtleties and evident specifics, depending on the country's economic development level, the type of government that dominates in national politics, and citizens' national traditions and mentalities. (Baiturova, 2013)

When it comes to clannishness and tribalism as a problem with the functioning of the Kyrgyz Republic's public administration model, we can claim that tribal relations have long dominated the state, forming the foundations of governmental and other structures. Such linkages draw attention to the interests of some circles at the expense of the interests of the entire population and the state, resulting in an unhealthy power struggle. Relatives and representatives of the ruling class are actively moving into existing state structures in the republic. This jeopardizes the country's democratic governance fundamentals. (Baiturova, 2013)

3.3.1 E-government in Kyrgyzstan

The creation and growth of e-government are becoming increasingly important sectors of modern states' internal policy. At the same time, one of the most difficult aspects of the state-building process is the digital transformation of state and local administrations.

The Kyrgyz Republic has been trying for years to establish an electronic/digital government as a means of upgrading the public administration system.

In reality, the E-Government Strategy for 2014–2017, which was adopted in 2013, launched off this process by focusing on making government more efficient, transparent, responsible, open, and citizen-centred. Although the initial phase to create an integrated e-Government system, which should have allowed citizens access to priority services, has been completed as a result of its implementation, the full-scale implementation of digital technologies and other innovative solutions remains an ongoing task that requires further development. The most active development of e-government began in 2017.

In Kyrgyzstan, as in many other nations around the world, the creation and development of electronic government has become one of the top goals for strengthening public administration. The creation of electronic government reflected a particular state policy.

The digitization of state authorities and local self-governance, i.e. the creation of electronic government as a system of interactive information exchange between the state and citizens via the Internet, was one of the program's key goals. Four stages of its genesis were determined. At the first stage (Information), a government creates an Internet portal to publish information about services and general information, such as opening hours, contact lists and telephone numbers.

At the second stage (Unilateral Interaction) the government coordinates citizen and private sector contact. Numerous interactive services are being launched at this point, allowing citizens to access the government's Internet portal and fill out various forms.

At the third stage (Bilateral Transaction), the processing of transactions is carried out by state agencies, and financial and legal services are already available..

The fourth stage (Transformation) is a concerted effort to adopt new technology and apps that promote the usage of cross-agency data sharing. Citizens will be able to switch from one service to another without having to register and verify their identification multiple times, thanks to the introduction of unified portals. Government databases can become interactive and communicate data with one another. The transition from traditional to electronic government is nearly complete at this point.

One of the long-term and comprehensive programs was the construction of e-government. Likewise, tasks were established to improve the legislative and regulatory framework in order to create favourable conditions for the development of e-government and to ensure its information security. (Aidaraliev, 2007)

The Action Plan of the "Electronic Government" program identified a number of priority projects, including:

- Project for the provision of public services;
- Creation of a unified state portal (www.gov.kg) with the possibility of integrating the websites of government agencies;
- Creation of a network of public centres for access to information;
- Automated human resource management system;
- State Population Register;
- Creation of a system of judicial information and management;
- Systems of juridical information"; "Project for the provision of customs reporting", etc. (Savinov e al. 2020)

Several government agencies have started to implement electronic document management systems. By automating the procedures of creating, approving, documenting, and monitoring the execution of incoming, outgoing, organizational, and administrative documents, it simplified the office work functions performed by ministries' workers.

Sector-specific information systems and resources have also been created (registers: population, legal units, education, vehicles, and real estate ownership; automated systems: treasury, medicine, geology and mineral resources, etc.)

However, for a variety of economic and political reasons, the plan to implement e-government on schedule and in full scale failed. As a result, the Government of the Kyrgyz Republic established an Electronic Government Centre and adopted the Program on the Implementation of Electronic Government for 2014-2017 to strengthen coordination and build universal standards for interdepartmental electronic communication. (Ministry of digital development of the Kyrgyz Republic, 2014)

In accordance with the National Strategy for Sustainable Development, this initiative aims to substantially improve the use of ICT in state executive authorities, boosting the efficiency of their actions, increasing transparency, and broadening the range of e-services supplied. The program prioritized four areas: the establishment of a statewide e-government system, securing the financial and economic effectiveness of ICT projects, expanding human resource potential, and establishing a management structure. The program's implementation action plan is divided into three stages. The first stage is preparation, the second is transition, and the third is implementation.

The first stage included the formation of a structure, management and coordination, the preparation of detailed roadmaps in priority areas, the development of individual plans for government bodies, the revision of existing regulatory legal acts and preparation of new updated ones, the preparation of technical specifications and the purchase of equipment and software.

The adoption of a full package of regulatory legal actions in all directions, the organization of tenders, and the procurement and installation of common ICT services were all scheduled for the second transitional period. The third step entailed putting the overall infrastructure in place, training staff, and informing the public. In 2016, the government established a new state agency called the State Committee for Information Technologies and Communications to coordinate efforts and speed the transition to e-government technologies.

3.3.2 Current state of implementation of the e-government strategy

Certain successes have been achieved within the above-mentioned context of program implementation and e-government construction. A test version of a public services portal has been constructed and published. There are 189 electronic services in the list. The "Tunduk" system was implemented to ensure electronic interdepartmental communication. (Khamzaeva e al., 2020)

The Tunduk system is built on an Estonian X-road system of interagency cooperation, which is one of the best international standards. According to international experts, the system's deployment might save up to $300 million per year. The system's main goals are to improve record management efficiency and assure openness. Almost every government agency now has its own website on the Internet, which provides a variety of information services. (Khamzaeva e al., 2020)

E-government is a powerful tool in the fight against corruption. The adoption of the Kyrgyz Republic's Ministry of Finance's electronic public procurement system resulted in standardization of the procurement process, eliminated bureaucratic intervention, ensured the objectivity of decisions, and made the procurement process visible. Despite the achievements, there are still numerous obstacles to overcome. As a result, Kyrgyzstan was ranked 83rd out of 193 nations in the UN EGDI rating in 2020. (UN, 2020)

Advanced information and communication technologies must have the potential to improve municipal government systems and serve as the primary tool for change, revolutionizing political processes and challenging old institutions and methods. E-government has the potential to be one of the most effective tools for Kyrgyzstan's political and administrative reforms. Its implementation will increase the national economy's global competitiveness by allowing it to use state resources more effectively, significantly improve the quality of public services, strengthen citizens' trust in the authorities, and increase the national economy's global competitiveness in the global market. (Khamzaeva e al., 2020)

3.4 Barriers of E-government development and future expectations

The main challenges of e-government development are the provision of digital services and the development of ICT infrastructure. According to the latest available statistics from the International Telecommunication Union, in 2017, Kyrgyzstan took the 109th place out of 176 countries in the world and the last place among the CIS countries. Other problems include the insufficient number of individual Internet users - 38% in 2017, and households with a computer at home - 12% in 2019. (ICT Development Index, 2017)

A new stage in the formation and development of e-government in Kyrgyzstan is associated with the solution of these and other problems, which caused the adoption of the Concept of digital transformation “Digital Kyrgyzstan 2019–2023”. Its strategic goals are fully consistent with the National Development Strategy of the Kyrgyz Republic for 2018–2040. (Ministry of Justice of the Kyrgyz Republic)

The concept identifies several priority tasks related to the development of e-government. Among them are the provision of high-quality digital services, increasing the efficiency, effectiveness, openness, transparency, accountability and combating corruption in the public administration system; and increasing the level of citizen involvement in the decision-making processes.

The consumption of international line bandwidth has increased dramatically in recent years, owing to Kyrgyzstan's reliance on Central Asian neighbours for access to international communication lines. Russian material accounts for 50% of total Internet demand, with foreign resources accounting for 80% of total demand. (Economic Comission for Europe, 2020)

Due to the substitution of fixed-line services by mobile services, the Kyrgyz fixed-line service market has declined in recent years. The wireless sector is competitive, with three major mobile operators now serving over 98 percent of the population with mobile services. In Central Asia, the mobile services sector is still one of the most vibrant. The authorities imposed forced user personification between 2014–2016, which affects Kyrgyzstan's more over 6 million mobile users. This was done to increase mobile device owner monitoring and theft protection. According to the report "The State of Broadband: Broadband as a Catalyst for Sustainable Development" published by the Broadband Commission for Digital Development of the ITU and UNESCO, more than 10% of the household budget should be

allocated to pay for a basic package in the case of more than 80% of the population of Kyrgyzstan.

3.4.1 E-government paradox

According to Knox and Janenova, there are paradoxes in implementing and developing e-government. The authors claim that despite Kazakhstan's competitive and leading position among the developing countries, mostly thanks to its oil and gas resources, and its serious progress in providing public services through principle of "one-stop shop", the country struggles in terms of five aspects. (Knox, Janenova, 2019)

We will describe below and compare it to the setting in Kyrgyzstan.

Technological aspect

The authors review the intention of government to digitalize all the processes whereas the quality of provided services remain poor. In the country that lacks clean water from the tap, the focus should be primarily on solving the fundamental issues, not to try to convert them in an electronic version. The focus group in this work stated that it is just "poor services provided faster". (Knox, Janenova, 2019)

In Kyrgyzstan, the situation seems even worse, since the country's economic development, in comparison to Kazakhstan, is far below. Thus, according to Legatum Prosperity Index (2021), Kyrgyzstan is ranked 90th, and Kazakhstan is 64th in the countries' economic well-being ranking.

Transaction speed

The authors critique the "*ambiguity around how public services are defined*", arguing that there are many contradictory services performed by people, not computer, and whereas some services are in high demand, there are also a services that "*raise questions about their value to citizens*", and many "*are left outside the scope*". The focus group concerns that in implementing e-government, there is a big role of "*tick-box mentality*". (Knox, Janenova, 2019)

In Kyrgyzstan, there are also a number of public services that may be consistently ordered, eliminated and/or added, the problem is that while implementing e-government, there is a lack of strategic thinking in how to organize the public services documentation workflow in the most efficient way without loosing the sense.

Isomorphic mimicry

The authors critique the approach of government to adapt Western-imposed conditions in implementing e-government tools by engaging the citizens in decision-making processes, referring to their focus group that claim Kazakhstan as an "*omnipotent state*". Focus group also compares Kazakhstan to other countries with recent political instabilities, including Kyrgyzstan; hinting that Kazakhstan is stable in terms of politics. However, what we see from the recent developments in Almaty in January, 2022, the situation and political context changes as new elites come instead of the previous ones, and even Kazakhstan, "*a peaceful country with many ethnic groups living harmoniously*" can experience political turmoil.

Without digging deep into politics now, it should be stated that inclusive government in both Kyrgyzstan and Kazakhstan are needed more than ever before. In the epoch of extremely tense interconnectedness through social media and other web platforms, citizens should be definitely engaged in the decision-making process.

Corruption

The authors critique the ostensible effect of e-government's influence on reducing corruption by limiting the official-citizen personal contact and minimizing the chances of bribing, which is "*the case not just for Kazakhstan but also across post-Soviet countries*". They claim that while administrative corruption is at some point reduced, the big corruption schemes still remain and prosper. Authors studied that According to Transparency International's Corruption Perceptions Index (2017), Kazakhstan is ranked 122.

This is the case for Kyrgyzstan, too. However, according to the latest Transparency International's Corruption Perceptions Index (2020), Kazakhstan went up for 28 positions and now is on 94th place, and Kyrgyzstan is on 124th in 2020 compared to 135th in 2017. It can be argued that small achievement is an achievement too. Certainly, implementing e-government cannot solve all the corruption issues at one moment, however the small steps are taken already.

(Half)-open government

The authors argue that the government only imitate the open-governance principles, while practicing only one-way interaction with citizens, since the country still remains authoritarian; and it causes a great scepticism among the population

Even though Kyrgyzstan is alike Kazakhstan, the general trend is that latter is considered more authoritarian. (Cummings, 2004)

4 Practical Part

This chapter will also look at the evolution of a specific digital service offered in the countries, namely the issuance of an electronic COVID-19 vaccination certificate. Then there will be a survey and a SWOT analysis. This will address the second partial objective of the thesis.

The third partial objective will be addressed by conducting a comparative analysis of e-government development in Kyrgyzstan, Russia, and Kazakhstan. Kazakhstan is the closest neighbour of Kyrgyzstan and Russia is the major actor in the post-Soviet region. All of the aforementioned countries have developed national digital development policies or programs at some point.

4.1 A comparative analysis of e-Government

Kazakhstan is betting on the digitalization of economic sectors, the transition to e-government, the implementation of the "digital Silk Road," human capital development, and the construction of an innovative economy as part of the "Third Modernization of Kazakhstan: Global Competitiveness" Program. (Ministry of Justice of the Republic of Kazakhstan)

The introduction of modern technologies in the field of public administration is defined as a systematic transition to a digital state - the transformation of state infrastructure for the most efficient provision of services to the population and business. The introduction of digital technologies will allow citizens to quickly and independently receive public services in electronic format. Many government agencies, knowing about the needs of citizens, will be able to contact them in advance to provide services without the need to visit institutions.

As previously stated, the National Strategy for Sustainable Development for 2018–2040 and the Taza Koom State Informatization Project have prioritized the following aspects: Building a world-class digital infrastructure; creating a favourable environment for long-term innovative development; providing digital opportunities to all segments of the population; involving citizens in the governance of the country through digital technologies; forming an open digital society; and establishing a regional hub for IT business and IT innovations on the "digital Silk Road." (Ministry of Digital Development of the Kyrgyz Republic)

Furthermore, much emphasis is placed on the need to improve the quality of digitally delivered public services, the use of digital technologies to combat corruption in government activities, and the use of modern digital communication channels to encourage citizens to participate in state and municipal government activities. As a result, the digitization of public administration is viewed as a two-way process aimed at enhancing the population's digital literacy as well as incorporating digital technologies into the delivery of public services.
In Russia, the government's "Information Society" program has been in place for more than a decade. This document establishes the tasks and measures for the Russian Federation's information and communication technologies domestic and foreign policy, with the goal of developing the information society, forming a national digital economy, safeguarding national interests, and implementing strategic national priorities. The program was incorporated into the new national program "Digital Economy," which will run until 2024. It bets on regulatory restrictions, human capital and education, the development of research competences and technical foundations, and information infrastructure and security. (Ministry of Digital Development, Communications and Mass Media of the Russian Federation).

The program explicitly states that the digitalization of the public administration sector is aimed at equipping public authorities with modern digital technologies to increase the efficiency of their activities in terms of providing public and other services, as well as further introducing the principles of socially-oriented management. It directly emphasizes the need to improve the performance of government bodies, the interaction of state (municipal) authorities, citizens and businesses based on the use of information and telecommunication technologies.

Table 1 Planned results of digital development in countries

Kazakhstan	Kyrgyzstan	Russia
- share of Internet users - 82% of the population; – entry into the top 30 most developed countries of the world by 2050; - by 2023, the creation of 300 thousand jobs; automation of 80% of public services; – growth of labor productivity in the manufacturing industry by 49.8%; – GDP growth to 30% by 2025.	- share of Internet users - 75% of the population; – 100% provision of all households with the Internet; – 100% provision of the rural population with access to the Internet; – entering the Top 50 countries in the UN e-Government Development Index; – entering the Top 50 countries in the Information Society Index.	- growth of information technologies in management by 50% by 2025; - the share of households with broadband access to the Internet is 97% by 2025; - the share of electronic public services provided by 2025 is 80%; – reducing the volume of commercial losses of electric energy by 2025 to 5% compared to 2017.

Source: own processing based on the available information at the websites of Ministry of Justice of the Republic of Kazakhstan, Ministry of Digital Development of the Kyrgyz Republic and Ministry of Digital Development, Communications and Mass Media of the Russian Federation.

The Table 1 above represents a set of goals that the countries strive for achieving, some by 2023 and some by 2025. Those sets differ by its nature, timeline, capacity and volume. For instance, while Kazakhstan attempts to level up the labour productivity in the manufacturing industry by almost 50%, Kyrgyzstan aspires for entering the top-50 countries in the UN e-Government Development Index, and Russia plans to reduce the volume of commercial losses of electric energy by 2025 to 5% compared to 2017.

Unfortunately, national strategies and programs are implemented primarily by depending on the countries' "own forces". As a result of this economic divergence, several digitalization targets have been established as benchmarks (Table 1), and integration synergy opportunities have been overlooked.

Digital technology development opens up new opportunities for cooperation for those countries based on a unified network infrastructure, common digital platforms, and new digital solutions that allow for shorter distances, cross-border collaboration, the creation of new jobs, and the development of previously untapped areas of business activity.

When analysing data from international organizations on broadband Internet access, computerization of the population, and the spread of Internet technologies, it is important to consider the heterogeneity of states' socio-economic development, which has a direct impact on their level of digitalization.

While the Table 1 demonstrates the plans that the countries strive to achieve for the upcoming years, the Table 2 reflects the latest available share of internet users in all three countries for 2020.

Table 2 Indicators of development of the ICT sphere, 2020

Countries	Fixed broadband subscriptions		Share of users		
	thousands	per 100 inhabitants	Computer	Internet	Mobile Phone
Kazakhstan	2616	13.55	84%	86%	91%
Kyrgyzstan	269	4.19	12%	70%	-
Russia	33872	22.52	72%	80%	85%
Maximum value	483550 China	57.85 Gibraltar	98% Kuwait	100% United Arab Emirates	100% Katar, Bahrain, UAE

Source: own processing based on data from Digital Development Dashboard of International Telecommunication Union accessed at: https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/Digital-Development.aspx

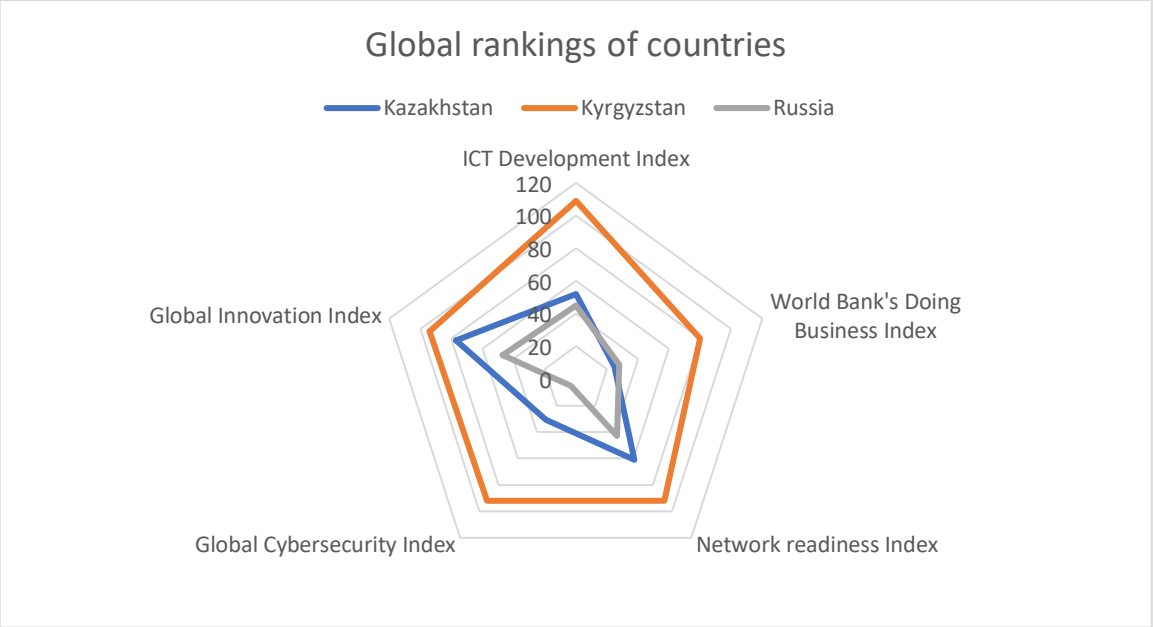
The findings in Table 2 show that broadband Internet connection options in Kazakhstan, Kyrgyzstan, and Russia differ significantly. The highest indicator belongs to Russia (almost 33 millions). However, when compared to the world leaders in terms of the aforesaid parameters – China and Gibraltar – Kazakhstan, Kyrgyzstan, and Russia hold relatively low places.

In terms of personal computer distribution, Kazakhstan and Russia have a little gap (84 percent and 72 percent, respectively), however Kyrgyzstan has a critically low indicator (only 12 percent).

However, Internet usage varies slightly by country: 86 percent in Kazakhstan, 80 percent in Russia, and 70 percent in Kyrgyzstan. They do, however, fall behind the world leader, the United Arab Emirates, which has a 100% rate. The significant disparity between the indications of users with computers and users with Internet connection in Kyrgyzstan can be explained by the fact that many residents, particularly in remote regions, prefer to utilize tablets and phones for Internet access since they are more cost-effective.

When it comes to ICT accessibility, Kyrgyzstan differs significantly from Kazakhstan and Russia. Various international ratings provide a full picture of the status of development of digital technologies, allowing for a comparative examination of state positions.

Graph 1 - Global rankings of countries



Source: own processing based on data of World Bank, ITU and others.

The data in Graph 1 illustrates that there are large disparities in ICT development between countries, which are almost probably related to their economic development levels. In the case of Kyrgyzstan, there is a particularly large gap. However, in a favourable institutional environment, this lag can be viewed as an underutilized market potential that can be exploited by investors and entrepreneurs.

4.1.1 Electronic COVID19 vaccination certificates

The coronavirus pandemic has revealed a number of unresolved public health issues. Most of the developed world powers turned out to be unprepared to combat this infection and to carry out vaccination rapidly. This chapter will examine the function of extracting the electronic certificate from the websites of governmental healthcare services with the use of various criteria.

The principles and criteria for measuring the quality and effectiveness of a website as a resource are essential during developing, constructing, and operating it. The website is a large, integrated electronic resource with generated electronic catalogues, databases, and other features. As a consequence, the website must be characterized using a system of evaluation criteria comprised of a set of complex evaluation characteristics. (Sakowicz, 2003)

The complex of interconnected elements of the system,a, should be divided into criteria that assess its quality and efficiency. The compliance of an integrated electronic resource with particular conditions and needs, such as accessibility, relevance, and regular updating of content, is used to determine quality. (Alguliyev, 2018)

Based on the various methodologies proposed by Taherdoost, Sahibuddin and Jalaliyoon (2015), Lindgren and Janssen (2013) and others, we can identify the following criteria for comparison of e-government healthcare tool in Kyrgyzstan, Russia and Kazakhstan.

–*Analysis of important categories*

It is essential to analyse the correct functioning of various categories of the web resource: login forms, personal account, registration, etc.

– *Testing the main page*

Most users are redirected to the main page of the site, which, in turn, should interest visitors and encourage them to continue using this web resource regularly.

– *Content quality assessment*

Before posting content on the site, it is vital to assess the language for readability, check literacy, and ensure that visual images and video material, as well as other page elements, are shown correctly and appropriately. It is also a good idea to double-check that the aims of the pages are aligned with their content.

Kyrgyzstan

Kyrgyzstan, being a developing country, was not an exception. Even after two years after the pandemic sparked, states must solve many long-term social and economic issues. As travels and business operations restore, a person should have either a fresh PCR test result or a valid vaccination certificate. In Kyrgyzstan, initially when person receives a second dose of the vaccine, there is a practice of issuing a paper certificate (though it's hard to call it so) with handwritten data on it, see below the Figure 1.

Figure 1 - Certificate of COVID-19 vaccination in the Kyrgyz Republic

Source: own possessing

Obviously, a Russian language hand-written paper would unlikely be acceptable during the travels or meetings outside of the country. Under the Ministry of Digital Development and the Ministry of Health and Social Development of the Kyrgyz Republic, the IT experts developed and launched a service for remote issuance of an electronic certificate of vaccination against COVID-19 through the State Electronic Services Portal (portal.tunduk.kg). The certificate can be obtained by both citizens of the Kyrgyz Republic and foreign citizens and in 3 languages – Kyrgyz, Russian and English. There are 4 steps to get a certificate:

1. To enter a government website for electronic services (portal.tunduk.kg)
2. Log-in using the electronic signature or eID
3. Go to "Healthcare" section and choose "Issuance of electronic certificate of COVID19 vaccination"
4. Press the "Send request" button in order to get the certificate

E-certificate will be generated automatically and immediately, it is possible to print it or save it in PDF format. It contains a QR code so it is possible to check the validity of the document, as seen in the Figure 2.

Figure 2 - Electronic certificate of COVID-19 vaccination in the Kyrgyz Republic

КЫРГЫЗ РЕСПУБЛИКАСЫНЫН
САЛАМАТТЫК САКТОО ЖАНА
СОЦИАЛДЫК ӨНҮКТҮРҮҮ
МИНИСТРЛИГИ

MINISTRY OF HEALTH AND
SOCIAL
DEVELOPMENT OF THE KYRGYZ
REPUBLIC

COVID-19 КАРШЫ ЭМДӨӨ СЕРТИФИКАТЫ / СЕРТИФИКАТ О ВАКЦИНАЦИИ ПРОТИВ COVID-19 / COVID-19 VACCINE CERTIFICATE

Аты / Имя / Name:	[redacted]
Фамилиясы / Фамилия/ Last name:	[redacted]
Атасынын аты / Отчество / Middle Name:	[redacted]
Туулган күнү / Дата рождения / Date of birth:	[redacted]
Жынысы / Пол / Sex:	[redacted]
Жеке номуру / Персональный номер / Personal identification number:	[redacted]
Вакцинанын аталышы / Наименование вакцины / Vaccine name:	Vero Cell
Өндүрүүчү / Производитель / Manufacturer:	Синофарм / Sinopharm
Товардык аталышы / Торговое обозначение / Trade designation:	Beijing CNBG - BBIBP - CorV
1 доза / 1 доза / The first shot is taken on:	16.07.2021 / July 16, 2021
Серия № / Серия № / Serial number:	[redacted]
2 доза / 2 доза / The second shot is taken on:	06.08.2021 / August 06, 2021
Серия № / Серия № / Serial number:	[redacted]

[redacted]

Маалыматты текшерүү үчүн төмөндөгү QR-кодду сканерлениз
Для проверки данных необходимо отсканировать указанный ниже QR - код
To verify the data, you need to scan the QR code below

Сертификат сформирован / Certificate generated: [redacted]

Source: own possessing via www.portal.tunduk.kg

Kazakhstan

In Kazakhstan, inhabitants also can get an electronic certificate containing all necessary data – personal details, dates, vaccine type and dosage, however those are available only after the

second dose is received. The certificate, according to the Ministry of Health of the Republic of Kazakhstan, is available via mobile application "eGov Mobile" in all three languages – Kazakh, Russian and English. Same as in the case of Kyrgyzstan, Kazakh certificates also contain a unique QR code enabling the certificate validity control. However, unlike Kyrgyz certificate, the Kazakh one is not accessible via computer. Thus, one cannot obtain it from the website, but only using a mobile application.

In order to obtain the certificate, a user must do 4 steps:

1. Download a mobile application "Egov Mobile"
2. Login or register using the NID number and the phone number that was used for vaccination
3. Go to "Digital documents" section
4. Choose the "Electronic COVID-19 Vaccination Passport"

Russia

In case of Russia, they also provide their citizens with a possibility to extract an electronic certificate from the website. Same as in Kyrgyzstan, there is a unified governmental website with various services. On the website (https://www.gosuslugi.ru/landing/vaccination) a user can get the certificate in several steps:

1. Go to the website of GosUslugi
2. Go the "Health" section and choose "Certificate COVID-19"
3. Log-in using the phone/email with password or using an electronic signature
4. Press „Send request" and the certificate with QR code will be generated

As we can see and conclude, in all three countries there is an opportunity to obtain a COVID-19 vaccination certificate remotely in few steps, without going somewhere physically and/or wait the queue, pay fees and do the paperwork. In case of Kyrgyzstan and Russia it is possible to get the certificate via website, while in Kazakhstan it's possible to get only using the mobile application.

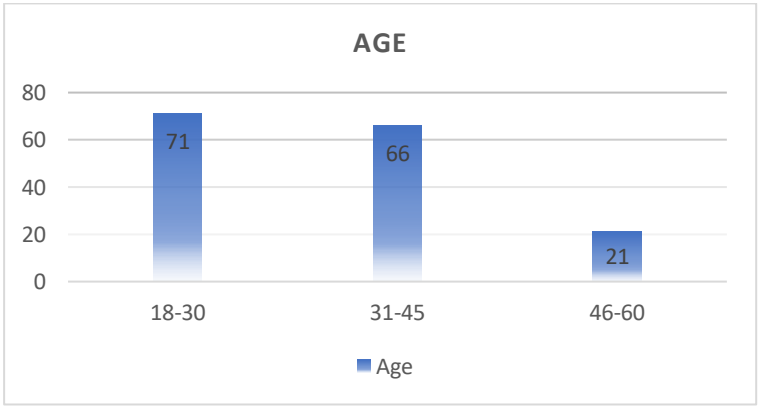
4.2 Survey

As part of the preparation of this thesis, a survey was conducted to form a complete picture of the problems and needs in relation to e-government services. The purpose of the survey is to examine the Kyrgyzstani citizens' concerns regarding the e-government tool for extracting the vaccination certificates. It is broadly known, as mentioned previously, that there is a certain scepticism regarding to functioning of e-government tools. By this survey, the author attempts to reveal the efficiency and inconsistencies of a specific e-government service.

In the survey the author combined convenience sampling and snowball sampling techniques. Overall, due to the survey tool's limits, 158 respondents participated in the survey, differing by age and occupation.

The Graph 2 below shows us that more that almost half of the respondents are in their young age between 18 and 30 (71 respondents), while the second half are respondents between 31 and 45 (66 respondents) and the tiny amount between 46-60 years old (21 respondents).

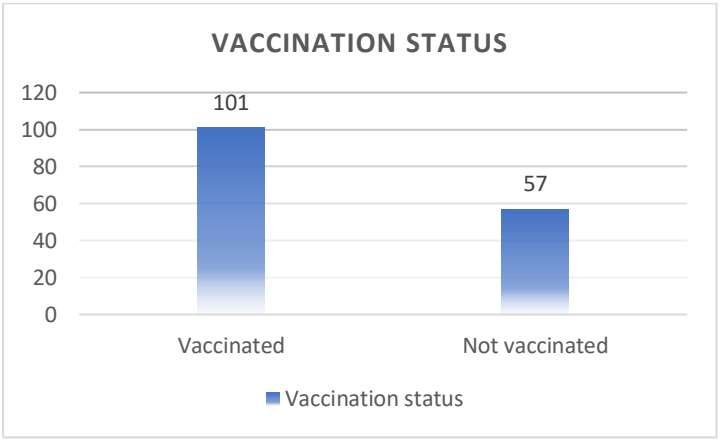
Graph 2 - Age



Source: own processing

The Graph 3 demonstrates that more than the half of respondents are fully vaccinated (101 respondents), which may signalize us about growing interest of inhabitants in vaccination as the pandemic continues to mutate and spread.

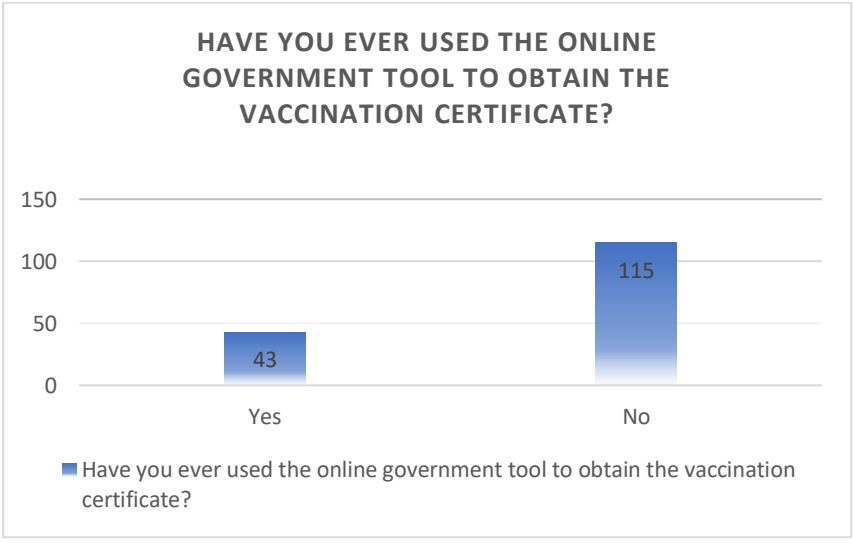
Graph 3 - Vaccination status



Source: own processing

The next Graph 4 illustrates that among those fully vaccinated respondents, 43 of them have at least once used the online government tool to obtain the certificate, which is a quite impressive result, given that the usage of such tools in the developing country is not regular.

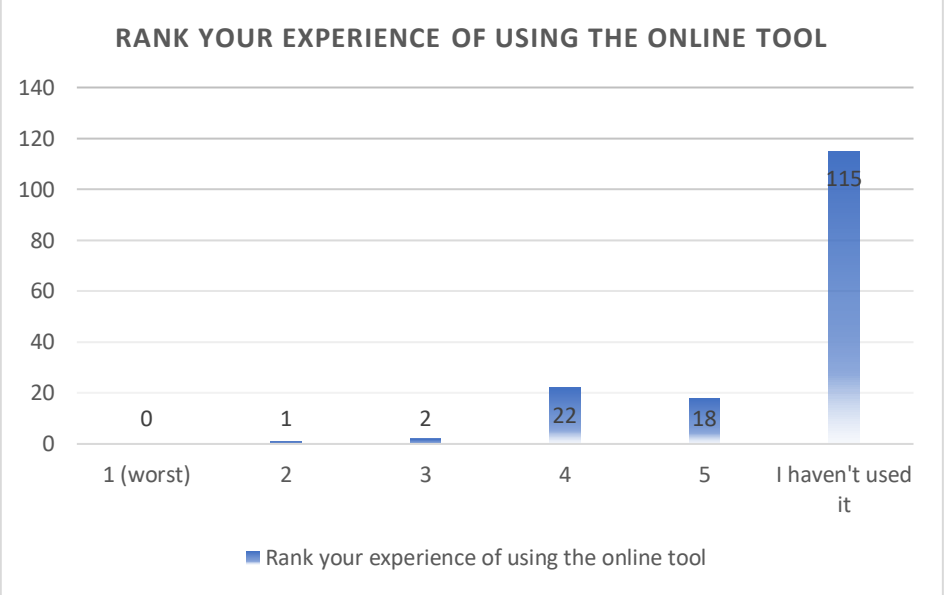
Graph 4 - Use of online government tool



Source: own processing

From the Graph 5 below we can see that there are 43 responses of various ranking of the using experience – from 2 to 5. There is no ranking 1 (the worst) among the responses which may hint us that the online service is not badly designed. Majority of respondents who have ever used the online service ranked it with 4 stars (22 respondents) and 5 stars (18 respondents), while only one person ranked it with 2 stars and 2 people ranked with 3 stars.

Graph 5. Experience ranking



Source: own processing

The last question of the survey was designed as "Please describe your experience – what did you like and what would you change?" with a free text format. Majority of answers were vouching for "*not changing anything*" and "*all works perfectly fine*". There were, indeed, some respondents who were not caring much about describing their experience, by responding "I don't care" or just putting a slash "/" or dash "-" to not leave the response form empty.

4.2.1 Chi-squared test

The Chi-square test is a statistical nonparametric method that is used to determine whether there is a demonstrable significant relationship between two characters. The basic idea of the Chi-square test is to compare the observed and expected frequencies. We can find the observed frequencies from the contingency table. Expected frequencies must be calculated. The calculation is based on the assumption that the null hypothesis applies, which assumes that there is no dependence between two qualitative quantities. Based on the probability distribution of Chi-square, the probability of occurrence of such or even more extreme value is calculated. This probability is called the achieved level of significance of the statistical test (p-value). If it is less than 0.05, we reject the null hypothesis. This means that the

probability that the observed differences or dependencies would occur only by chance is less than 5%.

This thesis tested the connection between the age and its impact on using the online service. We call the null hypothesis (H_0) the assumption that we make and want to verify. Validation of H_0 is then called null hypothesis testing. In the case that H_0 does not apply, it is necessary to state what other alternative we are considering, when this possibility is called the alternative hypothesis and is denoted H_A, while in general H_A does not have to be a negation of H_0.

The significance level α (alpha) is the probability (risk value) that we reject the null hypothesis, even if it is true. In practice, it is $\alpha = 0.05$ or $\alpha = 0.01$. In this work, a significance level of $\alpha = 0.05$ was used, where we accept the test result with a 95% probability.

The following hypothesis was tested:

There is a connection between the age of respondents and usage of the online service.

Within this hypothesis, the following 2 hypotheses were formulated:

H_0 – There is no connection between the age of respondents and usage of the online service

H_A - There is a connection between the age of respondents and usage of the online service

Age	Have you ever used the online government tool to obtain the vaccination certificate?		
	Yes	No	Total
18-30	37	18	55
31 and more	6	40	46
Total	43	58	101

It should be noted that those who are not vaccinated, are not able to use the online tool technically. Thus, we eliminate them (57 respondents) from the amount of respondents with the answer "No".

OR = 13,7 (4,91 to 38,25)

p-value = 0.0002

$\xi 2 = 30.13$

Thus, we can conclude from the conducted test that H_0 can be rejected, and the result of the test is **there is a connection between the age of respondents and usage of the online service.**

4.3 SWOT Analysis

A short SWOT analysis of the e-government will be provided in the final section of this chapter. Understanding the potential of e-government requires a SWOT analysis. SWOT analysis is a technique for analysing both the internal and external environments by identifying strengths and weaknesses and allocating opportunities and threats.

Table 3 SWOT analysis

Strengths	**Weaknesses**
- *Remote mode* - *Transparency* - *Unified database*	- *Usability and interface of some services might be not easily understandable* - *Insufficient funding* - *Lack of professionals*
Opportunities	**Threats**
- *To improve the image of government* - *To gain the trust of citizens* - *To cover the whole country, not only the capital and big cities* - *Increase of payments (preventing corruption)*	- *Hacking attacks, malware and system failure* - *Information security threat (leaks)* - *Reduction of jobs (automation)* - *Lack of accessibility for the households without Internet access* - *Low digital literacy among certain groups of society*

Source: own processing

Strengths

Remote mode.

Citizens can use the service remotely without having to travel to the administrative office. There is no need to, wait in a line, or fill out superfluous paperwork, which consequently, will save the citizen's time. (Rodríguez-Bolívar, 2014)

Transparency

Payments are made electronically, which eliminates cash issues. Everything is trackable, which helps to make procedures more transparent and accessible. The essence of e-

government is the online delivery of government services, which requires minimal personal contact between a citizen and a government official. As the e-government projects actually happen ehe number of encounters between citizens and state representatives has decreased. Also, the form of these interactions is changing: a digital portal becomes the official-citizen "meeting place". The nature of government services is similarly evolving. They become standardized and depersonalized in the e-government conditions, which reduces the incentive to exploit fraudulent mechanisms. (Rodríguez-Bolívar, 2014)

Unified database

A unified database is beneficial for citizens as it eliminates the need to log in several times as you move from one website to the next, and consequently, saves the citizen's time. In addition, a unified database will speed up decision-making, resulting in higher-quality commodities available from the government. (Andersen e al., 2011)

Weaknesses

Usability and interface of some services might be not easily understandable

Some services' usability and interface are difficult to comprehend, especially for individuals of advanced age. (Kassen, 2015)

Insufficient funding

Digital technologies in the Kyrgyz Republic have a low level of penetration into the society and have had little impact on the e-government development compared to Russia and Kazakhstan. It has a positive but slow dynamic, which is caused by insufficient funding too. (Kassen, 2016)

Lack of professionals

Frankly speaking, there are still few highly qualified professionals in the country who are able to bring many projects to life. It's worth considering to involve them from abroad, because it is simply physically unrealistic to prepare own professionals in a short time. There is a lot of work, and serious IT professionals should deal with it, first of all, because every inaccuracy in this project will cost decent financial costs. It is important to add here that it is necessary to have well-trained people on the ground, in the small cities and villages. (Saeed e al., 2021)

Opportunities

- *To improve the image of government*

By implementing the e-government development it is possible to positively improve the image of the government. The fact that the government rapidly jumps on board with the development of the digital growth demonstrates a genuine interest in the country's overall development. (IGT Global, 2019)

- *To gain the trust of citizens*

Increasing the level of citizens' involvement in the decision-making processes through the digital transformation of the system of state and municipal government will invariably lead to an increase of trust and respect of citizens. (IGT Global, 2019)

- *To cover the whole country, not only the capital and big cities*

The implementation of e-government will allow equal provision of services to all layers of population, including the most remote ones, the only thing that they need is an internet access. (Kassen, 2016)

Threats

- *Hacking attacks, malware and system failure*

The cybersecurity issue is one of the most serious threats. There is a high possibility of spyware, malware, dDoS attacks, and system failure in these unprecedented times of hacking attempts on practically every government. (Abassi e al. 2018)

- *Information security threat (leaks)*

The human aspect is also a major risk; there is a high chance of leakage, whether by accident or on purpose. . (Abassi e al. 2018)

- *Reduction of jobs (automation)*

The automation inevitably leads to the loss of jobs for ordinary employees of municipal services, especially the ones that do not require any specific or narrowly profiled knowledge. (Aikins, 2012)

- *Low digital literacy among the certain groups of people*

According to Soltobayev, certain groups in Kyrgyzstan demonstrate a low level of digital literacy in a number of indicators, such as the ability to configure software, use the Internet (search for information, create and post content, work with browsers, etc.). The author notes that the level of digital skills of people is determined by the current state of development of economy, digital technologies in the country and the level of development of competencies in principle in the world. (Soltobayev, 2020)

5 Results and discussion

Now, the issue of public administration has not yet had time to finally gain a foothold in the post-Soviet space, the need to institutionalize the processes of digitalization of government and society, as well as the introduction of modern technologies in the practice of public administration, have been identified as target priorities in all three countries - Kazakhstan, Kyrgyzstan and Russia. At the same time, only the digitalization of the process of providing public services is a common element of all strategies, concepts and programs, while other parameters of target documents are largely different. In some cases, much attention is paid to building new relationships and communications between the government and society, taking into account the widespread digitalization of public life. In others, more emphasis is placed on increasing the digital literacy of the population in order to increase opportunities for receiving public services in digital form. The most promising areas for further research on the digital transformation of state and municipal government in Kyrgyzstan may be the effectiveness of the provision of state and municipal services in electronic form, elections in digital format and the modernization of communication infrastructure.

It is critical to take all necessary precautions to safeguard data and prevent leakage to the greatest extent possible. Personal data, for example, is contained in the vaccination certificate, and this data must be protected by adequate medical confidentiality and privacy precautions.

As the survey revealed, there is a direct connection between age and internet usage. It's seen that younger respondents use the online tool more than seniors. This can be supported by the fact that the Internet is relatively young phenomena emerged in 1990s (Zandl, 2003)

Another thing is that the online tools, such as electronic vaccine certificates are designed primarily for citizens with the access to the Internet and sufficient digital literacy, which may exclude people living in rural areas without the access to Internet. According to Soltobayev, there is no international study or research on digital literacy of Kyrgyz citizens, however, the Ministry of Education is working tensely on developing the agenda for digital education. (Soltobayev, 2020)

Also, one of the primary issues in the implementation of the e-government is the question of funding. The government should be interested in their solution since they require funding from the state budget and various forms of state support, including foreign investments and

grants . The state's efforts should be focused on developing modern infrastructure, ensuring broadband Internet availability, creating conditions for people to use digtal technologies, ensuring a high level of integration of information and ICT devices, overcoming barriers to their growth, and developing standard guidelines for the digital transformation of economic sectors.

Moving further, the state instead of thinking about reducing the level of corruption, should think about educating citizens , primarily with the involvement of professional IT specialists. Technology is only a tool that can strengthen and give an additional dimension to imrpove the public services. The impact of the technologies themselves is not significant if people are not aware how to use it. A stable positive effect can only be achieved if a systematic knowledge delivery is performed to all the layers of population..

6 Conclusion

The main objective of this thesis was to analyse the level of development of e-government in Kyrgyzstan in order to give further recommendations for e-government implementation. The development of e-government in modern Kyrgyzstan has its own specific features related to the conditions of democratic transition and the overall digital development of the society. The process of digital transformation and municipal government is still at the stage of its formation in comparison with the neighbouring countries of the post-Soviet space – Russia and Kazakhstan.

As a conclusion, it can be stated that today the use of information technologies in public administration has both positive results in the form of reducing corruption and negative aspects. The use of ICT can significantly increase the level of transparency of government bodies and solve problems in financial departments and bodies that have direct contact with citizens. At the same time, the introduction of e-government is associated with a number of risks. As we see, Kyrgyzstan falls behind other neighbouring countries in a plenty of aspects. The task implementing e-government is complicated and requires patience, serious investments and, of course, high-skilled professionals.

The COVID-19 pandemic has clearly proved the value of digital technologies while also emphasizing the urgent necessity to accelerate digitalization efforts. It also demonstrated the significant impact that a lack of digital inclusion and inadequate ICT infrastructure has on the lives of society's most disadvantaged citizens. Putting inclusive and long-term digital transformation at the centre will aid countries Kyrgyzstan in recovering more quickly and ensuring that no one is left behind.

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8 Appendix

List of interview questions:

1. **How old are you?**

0-18
18-30
31-45
46-60
61 and more

2. **Are you vaccinated?**
Yes
No

3. **Have you ever used the online tool for COVID-19 vaccination certificate?**
Yes
No
I'm not vaccinated

4. **If yes, was it a positive experience?**
Yes
No
I never used it

5. **Share your experience (what did you like, what would you change?)**