UNIVERSITY OF MÜNSTER

DEPARTMENT OF INFORMATION SYSTEMS

E-Government and Digital Divide:
A Case Study of Azerbaijan's ICT Landscape

MASTER THESIS

submitted by

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Submission Date	06.06.2023

Acknowledgements

I would like to express my heartfelt gratitude to my mother, Rovshana, who has been my unwavering source of support and inspiration throughout my life and years of study. Her constant encouragement and belief in me have been instrumental in shaping me into the person I am today.

Special words of thanks belong to my former professor and Dean, Dr Anar Valiyev, who played a significant role in my academic development. His guidance and mentorship have been invaluable in preparing me for a better future.

Last but not least, I am forever grateful to my grandparents, family members and friends for their love and affection, which have provided me with comfort and strength during the challenging times. This accomplishment would not have been possible without all of you.

Thank you.

Abstract

In the last decade, the digital divide has come to be viewed as a sign of discrimination, along with race, class and gender, and efforts from countries are needed to overcome it. As a novel approach to domestic study in Azerbaijan, the author addresses digital inequality in the context of electronic governance processes, including economics and politics. The study understands the digital divide as a consequence of the economic and technological lag of certain groups of people and regions in the Republic from progress in education and communications. By shedding light on often-overlooked issues of the digital gap, this research aims to bring attention to the existence of digital barriers in the Republic of Azerbaijan that may not be readily apparent in daily life or immediate surroundings. The digital engagement of both urban and rural populations was analyzed, and the findings are illustrated through a qualitative assessment of the key parameters employed to determine the degree of digitisation within Azerbaijani society. At last, this dissertation work also present a compilation of recommendations, aiming to address the results of the research and contribute to potential solutions.

Keywords: digital divide, digital inclusion, ICT, e-governance, e-participation, e-service, Internet

List of Abbreviations

ASD - Asian Development Bank

ASIS - Azerbaijan Statistical Information Service

ATIS - Automated Tax Information System

ATM - Automated Teller Machine

AzEduNet - Azerbaijan Education Network

CIS - Commonwealth of Independent States

CPI - Corruption Perceptions Index

DESA - Department of Economic and Social Affairs

EC - European Commission

EGDI - E-Government Development Index

EPI - E-Participation Index

EU - European Union

GPON - Gigabit Passive Optical Network

IaaS - Infrastructure as a Service

ICT - Information and Communication Technologies

IoT - Internet of Things

ISP - Internet Service Provider

IT - Information Technologies

ITU - Telecommunication Union

MDDT - Ministry of Digital Development and Transportation

MSE - Ministry of Science and Education

NATO - North Atlantic Treaty Organization

NGO - Non-Governmental Organisations

NTIA - National Telecommunications and Information Administration

NWICO - New World Information and Communication Order

OECD - Organisation for Economic Co-operation and Development

QDA - Qualitative Data Analysis

SSC - State Statistics Committee

SST - Social Shaping of Technology

UN - United Nations

UNDP - United Nations Development Programme

UNESCO - United Nations Educational, Scientific and Cultural Organisation

UNSDCF - Sustainable Development Cooperation Framework

USSR - The United Socialist Soviet Republic

UTAUT - Unified Theory of Acceptance and Use of Technology

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1   Introduction

Data as the new oil has become a well-known phenomenon since the early 2000s, explaining an era in which access to information has surpassed access to oil as a resource and the driver of the economy (Nolin, 2020). Modern man exists and functions in the information society, the effective development of which depends on the technological production, storage, processing and transmission of information. The use of information and communication technologies (ICT) has transformed the processing and application of information (Warschauer, 2003). Accessibility to these technologies has been proved crucial in adapting to the new world order. The increasing importance and value of human capital predetermine the main basis for evaluating the effectiveness of public administration in terms of human access to basic types of assets: physical; human; financial and social capital. In this new era, speed and information have become paramount, and those who have control over these elements can keep up with the evolving world order. At a time when public and commercial relations between countries have developed and reached the level of globalisation, speed in communication has become an inevitable need (World Bank Group, 2016). Developments in information technology (IT) and e-sectors have found solutions to meet this need. With the Internet, which can be defined as an international information communication network, it has become possible to access all the necessary data using a device (Kshetri, 2018). In 1999, the inclusion of Microsoft and Intel in the Dow Jones Industrial Index proved that we are at the beginning of a new era in the sense that IT was officially recognized as one of the most important sectors in the global economy (Carveth, 2003). Thus, the online industry began to make a name for itself as a worldwide concept that created its internal dynamics beyond being a separate social rank.

Paradoxically, technological advancement, which once seemed capable to eliminate or at least mitigate many societal issues, instead exacerbates them (Nieminen, 2016). The current situation in the world is both similar to and different from those previously observed. The emergence and development of the information society reflected existing social discrepancies (Castells, 1999). Economics and politics, above all, explain the emergence of the information-rich and the information-poor within individual states, and the presence or absence of certain countries in the virtual space of the global broadband network (Graham, 2011). There are still thousands or millions of people who have neither the literacy nor the minimum income needed for using the Internet. The boundary now runs between those who have the technical capability and the necessary education to use the Internet and those who, due to lack of money

to buy digital devices and low IT skills, do not have access to the global network (van Dijk & Hacker, 2003).

The message remains highly relevant today, given that some 2.9 billion people, or 37 per cent of the world's population, have no access to the Internet at all and are therefore lagging based on the development of digital government and e-society (Roshanaei & Duan, 2021). According to Hinton et al., 2022, in the US alone, there are over 24 million people who do not have access to the digital world simply because it's not offered to them or they lack digital literacy skills to use devices. The COVID-19 pandemic exposed the severity of the digital divide between individuals who have and do not have access to digital channels. According to the International Telecommunication Union (ITU, 2020), the penetration of broadband network infrastructure and Internet access for every single person is the key to global digital transformation. A society that is unable to offer equal access to a broadband network connection to its residents will create a digital divide between those privileged to access online public services and those who cannot (Thawar, 2008). Helbig et al., 2009 note that the provision of online services is expanding globally and can enable governments to be more efficient, open, transparent and inclusive. Moreover, it highlights the significant improvement in electronic government or e-government development in recent years around the world, and that while a high level of national income determines progress in the public sector, digital infrastructure and human capital play an important role as well (Thawar, 2008). The digital gap not only restricts access to technology and the Internet but also perpetuates existing social and economic disparities. Thus, it is a problem that affects us all, as a society cannot reach its full potential if a significant portion of its population is left behind.

Digital public services have appeared in Azerbaijan relatively recently, under the assumption that potential users possesses digital literacy skills and have access to necessary devices. The emergence of the COVID-19 pandemic has shifted public and private sectors in Azerbaijan as well, including education, public health and commerce (Guseynov et al., 2021). The medical emergency forced the government and citizens to adapt to the changes using ICT. Although fast improvement in the e-government implementation process is visible, it does not ensure effectiveness and affordability for the public and may pose new threats such as the affordability of the Internet or access to ICT devices (Kuldosheva, 2021). More lately, the digital divide has become increasingly driven by technological characteristics, with the rapid diffusion of communication tools reaching just select segments of users, while others must make do with rapidly ageing technology (Warschauer, 2003). However, while the choice of a computer or the purchase of a mobile phone is a matter of personal opportunity, the technological divide means a segment of the country is lagging behind those that

have surged ahead (van Dijk, 2005). In an age in which information determines the development of production capacity and influences economics and politics, the digital divide is creating serious social problems in countries that already lack economic and intellectual potential (Warschauer, 2003). In other words, inequality makes the poor poorer and the rich richer. The Okinawa Charter on Global Information Society, adopted by eight industrialised countries, recognises seizing digital opportunities and bridging the digital divide as one of the priority tasks of the new century (Virchow & von Braun, 2001).

Thus, the dissertation paper aims to gain and illustrate an exploratory insight into the challenge of the digital divide in the Republic of Azerbaijan and how this obstacle affects the e-participation rates throughout the country. This field is a relatively new and evolving area of research, and there is still much to learn about the various factors that contribute to it; as well as its application to Azerbaijan. Currently, the difference between the regions of the Republic of Azerbaijan on the level of Internet access is not as significant as in the early 90s, but noticeable. Studies (Chen et al., 2018; Hung, 2004) related to the problem of growth and effective use of the digital potential of both urban and rural areas indicate not only the urgent need for its solution but also positioning the factors and conditions of its resolution, as well as identifying the priority areas of sustainable development of rural areas of the Republic of Azerbaijan.

Using digital devices and web tools should not be a privilege for people, be it school children or older generations, and the use of ICT should be available and taught. The author's background as an Azerbaijani citizen drives the motivation for this research. In short, witnessing the Web and the physical world meet, the interest in the topic increased together with concerns about to which degree the transformations affect individual lives and the e-society that we live in.

2   Literature Review

The scholarly literature on the digital divide is analyzed in the following chapter to identify key themes, controversies, and knowledge gaps. Through this review, the primary aim is to gain a deeper understanding of the current state of research and to identify topics for further research for the case study application in the next chapters.

2.1   The Digital Divide

2.1.1 Conceptualizing Digital Divides: A Review of Approaches in the Literature

After World War II, when the economies of Europe and America made a qualitative leap in their development, the problems of information society and data as a productive force came into the focus of the attention of philosophers, political scientists and sociologists (Hilbert & Katz, 2003). The post-industrial era saw the creation of new ideas about the communicative, informational nature of society. Consequently, the problem of digital inequality captured the attention of social science researchers. While vast advances in ICTs fields offer enormous opportunities for development and improvement, they are also creating new social disparities, usually analysed under a generic name that has come to be known as the *digital divide* (van Dijk, 2020). The term was first coined in the mid-90s and has since been used to describe the gap between those who have access to technology and those who do not (van Dijk, 2006). Although the concept has been defined in a variety of ways, it generally refers to the disparities in access to and use of technology between various groups of individuals. As explained by the scholar, the formation of the phenomenon was not only due to academic interest but also to the needs of the economic and political development of modern society.

Around the same period, the transition to the information society was proclaimed in various parts of the world; national and regional comprehensive strategies for this move began to be formulated (Dutton, 2004). The emerging information society prioritised providing all citizens with access to telecommunication infrastructure, services and content for sustainable and harmonious development. Thus, the issue of information equality has become an integral part of new societal development strategies already at the stage of their formation. Various research reports (EU, 2015; OECD, 2001; UN, 2023; World Bank Group, 2016) have helped to popularise the term and provide valuable insights into its definition, measurement, and policy im-

plications. Organisation for Economic Co-operation and Development (OECD) has defined it as:

> the gap between individuals, households, businesses and geographic areas
> at different socio-economic levels with regard both to their opportunities
> to access information and communication technologies and to their use of
> the Internet for a wide variety of activities. (OECD, 2001, p. 5)

Academic views on the nature of causes and forms of information, and subsequently digital inequality itself, have undergone changes over time, which has always led to adjustments in policies of different countries to overcome this obstacle (Petrova-Antonova & Ilieva, 2019). The digital divide was initially distinguished by the relationship of academic research to policy strategies for the transition to an information society and programs to overcome inequality (Sousa, 2019).

An important theoretical framework for the concept debate in the first stage was a **political economy approach** (Hung, 2004). According to the political economy approach, distributive relations are closely connected with the formation of motivation of individuals at various levels of the economy. Within the framework, institutions have an objective basis and represent the economic relations and economic interests of various groups of the population, which require coordination. Economics as a scientific and applied concept and theoretical discipline in the context of expanding and deepening the use of ICTs in social life requires a new understanding of the fundamental provisions of the theory of social reproduction, based on the digital basis (Dahlberg, 2015).

To a large extent, this approach continued The United Nations Educational, Scientific and Cultural Organisation (UNESCO) debates on the need for a New World Information and Communication Order (NWICO), actively developed in the 1970s and 1980s (Hannah, 2021). By arguing against unbalanced flows of IT and news from economically developed to developing states, from global political centres to peripheral countries, UNESCO demanded to overcome information inequalities at the global level (UNESCO, 2005). As a central part of the political economy approach, the concept of information poverty, determined by the lack of access to ICTs, has contributed to the growth of empirical research on digital divides not only across countries and regions but also between social groups identified based on traditional socio-economic indicators: income, education, gender, age, race, ethnicity (Sparks, 2013). As explained by van Dijk, 2005, the concept of the digital divide is used in both academic and political discourse, so there is a plurality of interpretations. The

aggregation of various forms of access to digital technologies seemed to be able to reflect the complex and multidimensional nature of the digital divide problem.

> Levels of Internet access can vary substantially. Today people living in poorer neighbourhoods may be able to surf the Web from public libraries, schools, and community centres, or even cyber cafes, but this is not the same as having automatic access via high-speed connections at home and the office. Nor is it the same as having all Internet, all the time, downloadable via personal appliances, digital assistants, and cellular phones for today's wired road warriors in planes, ships, and trains.(Yu, 2002, p. 7)

van Dijk, 2005, 2006 later made it evident that to adequately describe the state of the digital divide, more is needed to define the form of access and its level. It is much more important to understand how this access is linked to specific user strategies and practices. The term has therefore caused more confusion than clarification. Similarly, Gunkel, 2003 highlights that it is a very ambiguous term in the sharp dichotomy to which it refers. Thus, van Dijk, 2006 has even warned against several pitfalls of this metaphor; he highlights that the concept proposes a simple break between two separate groups and later on suggests that this gap is difficult to bridge. According to the recent message from UN Secretary-General António Guterres (UN, 2023), despite the efforts of international organisations and many states to overcome the problem of access, the inequalities outlined in the first phase of the study of the digital divide are still relevant, just as van Dijk predicted.

The study of the digital divide began with observations of the number and categories of people who have access to a computer and a network connection. Compared to economic, political or educational divides, the information criterion of social inequality has appeared relatively recently in the academic literature, and the further explanation of the concept and the number of articles has increased dramatically in the last years. In its earliest form, the term digital divide described a situation in which there were social groups with access to modern digital communication technologies, above all the Internet, and those without (Busy, 2000). As Viktorovna, 2016 writes, at the end of the twentieth century, the most important indicator of inequality was personal computer ownership; the new century, on the other hand, highlighted the importance of high-speed Internet access and the increase in relevant competencies in its use; today, the possibility and nature of regular use of digital technologies came to the fore. This definition has been replicated in the National Telecommunications and Information Administration (NTIA)'s primary study of the digital divide (Dimaggio & Hargittai, 2001). Thus, the authors of the research understood the gap as un-

equal physical access to IT, which also include telephone communication, without considering the problem in sociological discourse.

Consequently, a growing number of researchers have suggested that more attention should be paid to the philosophical, social, psychological and cultural underpinnings of the concept, not only to the physical access to devices (Capurro, 2000). According to DeHaan, 2004, scholars often limit themselves to descriptive analysis and rarely talk about the consequences of division itself. The author additionally notes that when analysing the digital divide, it is important to consider not just the presence and absence of Internet connectivity, but also how it is used. Subsequently, these thoughts led to the formulation of new needs including requirements for education, social engagement of people, and their readiness for new cultural practices in the digital environment. Over time, the digital divide has come to be understood not simply as a problem of access, but as constantly responding to current societal processes - including the uneven spread of Internet access in different regions of the world, the growth of e-government, and fluctuating behaviour in the digital environment (van Dijk, 2013).

2.1.2 Examining the Multiple Dimensions of the Digital Divide

Despite the continued relevance of the digital divide in global and national contexts, researchers' attention has recently shifted to new for of the digital divide, originating not only from unequal access to the Internet or ICT. A prevalent viewpoint in academic discourse is that the problem of the digital divide is far-fetched. Some sceptics argue that the digital gap "*is not the case that one either possesses information or does not.*" (Gunkel, 2003, p. 506). Over time, the digital divide has come to be understood not simply as a problem of access to the Internet and digital infrastructure, but as a complex phenomenon of an interdisciplinary nature. Several studies (Noce & McKeown, 2008; O'Brien & Ó Fathaigh, 2005; van Deursen & van Dijk, 2011) have highlighted that the inequality is often influenced by pre-existing social differentiation, i.e. income, race, ethnicity, age, geography and more. Elena-Bucea et al., 2021 have extensively studied the relationships between income and the digital divide. As the research showed, participants with higher income levels presented significantly positive differences in the usage and adoption of ICT, in comparison with middle and low-income individuals. Subsequently, scholars identified income as "*a global digital divide driver*" Elena-Bucea et al., 2021, p. 5. It is generally believed that digitisation makes a significant contribution to cost minimisation and is therefore crucial to the survival of both public and private sectors, as well as to productivity and income at the national level.

According to van Deursen et al., 2017, the digital divide reflects not only differences in individual resources but also how economic and political factors contribute to the gap. The scholars link the obstacle to variations in the ability of individuals to transform digital skills into tangible positive outcomes of everyday life. Following a study of Internet users in the Netherlands (van Deursen & Helsper, 2015), the authors concluded that the digital divide is multifaceted, meaning that it manifests itself in various spheres. Moreover, the findings showed that social support played a vital role in the process of empowering Internet participation. Similar research by Hampton et al., 2009 focused on how the level of digital awareness affects social exclusion and simultaneously investigated the impact of race and ethnicity on the process. One hypothesis advanced by scholars is that existing social imbalance is superimposed on the process of uptake and use of these technologies. In such a case, the structures of social interactions in the real world are transferred to the world of digital social networks, affecting the ability of individuals to use technologies and thereby increasing social inequality. Based on Bourdieu's theory of capital (O'Brien & Ó Fathaigh, 2005), which was later supplemented by Helsper (van Deursen et al., 2017), authors write that digital inequality directly affects the exclusion of the individual from the cultural and social realms of life. A similar study by Mutsvairo and Ragnedda, 2019 examined the challenges posed by the digital divide in Africa, concluding that inequality has a negative impact and impedes access to information, education and employment opportunities as well as limits people's political participation in the region.

Similarly, Nieminen, 2016 attributes the challenge of the digital divide to the uneven economic development of countries, as well as the socio-cultural, geopolitical and ethnic characteristics of the state. In their study of addressing digital equality, Middleton and Chambers, 2010 outlined the degree of influence of urbanisation on the formation of the digital divide. Their research on the relationship between gender, age or education and the intention to adopt technology revealed a correlation between the level of intelligence and the degree of digital literacy. As a result, the authors claim that the greater the degree of education of respondents, the higher the level of digital literacy. The intensive introduction of IT into various social institutions has raised the question of the impact of digitisation on people and culture and its impact on the level of education. Research by E. A. Abu-Shanab, 2011 showed that online activities such as sending emails; searching for financial, political or governmental information; online banking; job searches or booking trips are more common among people with higher education and it is likely that respondents with lower education are less likely to use the broadband network. van Dijk and Hacker, 2003 highlight that its use requires cognitive abilities, which are present in people with a higher level

of education. As the comparative analysis presented by van Deursen and van Dijk, 2014 has shown, the existing disparity and the unequal distribution of opportunities to create and access digital spaces across different regions or areas within a country is a significant contributor to the emergence and persistence of digital inequality among the population. The disparities can be responsible for the uneven levels of digital literacy and usage, which can further aggravate existing social and economic disparities. The concept of digital literacy emerged in the 90s and referred to the ability to critically evaluate and apply data that an individual obtains through interaction with a computer in different forms from a variety of sources (Gilster, 1997). Martin and Grudziecki, 2006 elaborated on this idea by adding that digital literacy is the understanding, attitude and ability of an individual to effectively use digital tools and capabilities to identify, access, evaluate, integrate and manage digital resources.

Consistent with the arguments above, the study by van Deursen and Helsper, 2015 revealed that respondents with a medium or higher degree of education were more likely than their less educated counterparts to take an active part in the government. With the emergence of online public services, the Internet became a world of possibilities not only for younger generations but for older people as well (Thawar, 2008). The success of digitally literate has become directly dependent on their digital competencies, which in turn means that the digital literacy paradigm in the current social context requires a clear systematisation of a huge set of digital skills and knowledge (EC, 2019). According to a prominent British scholar Belshaw, 2014, digital intelligence includes several key factors, among them are the cultural context of the Internet environment, the ability to work online, and possessing the skills to use 'digital' for self-development. Stack and Kelly, 2006 wrote that the development of the education system should not be achieved by replacing educators, but through increasing their digital training in the education system as a whole. Jenkins et al., n.d. believes that digital literacy includes the ability to use computers as *hardware* i.e. a need to understand how individuals and digital technology interact; an understanding of digital information structure and distribution, e.g. how to work with software; an understanding of the networking community; and finally, social media features. Researchers are divided when it comes to the relationship between the level of education and the specificity of ICT use. According to P. Bourdieu's concept (Calderón Gómez, 2021) education is understood as a form of cultural capital which actualises the need to use the Web. As such, the scholars responsible for the explanations of the field of digital literacy agree on one thing: only an understanding of how digital reality works can teach people to control the information flow and make interaction with digital technology a source of development rather than work.

Characteristic	Female	Male
Europe	89%	90%
The Americas	83%	83%
Commonwealth of Independent States (CIS)	83%	84%
Arab States	65%	75%
Asia Pacific	61%	67%
Africa	34%	45%

Figure 1   Internet usage rate worldwide as of 2022, by gender and region (Petrsoyan, 2023)

As the gap between men and women in access to the Internet is narrowing, recent research has focused on subtler forms of inequality as well (Colley & Maltby, 2008). The gender aspects of equal access to the Internet were first discussed back in the 90s (Staniszewski, 2000). Colley and Maltby, 2008 has found that women, compared to men, use the Internet less frequently, have a narrower range of Internet activities and have a poorer estimate of their Internet capability. The inequality is believed to be caused by the influence of traditional gender roles, interests and expectations. Thus, findings showed that women more often used the Internet for communication and social support, education and shopping; whereas men use the network for career building and socio-political information. In addition, negative effects such as "*pornography, phishing, spam, viruses, bad use of time, addiction, the proliferation of uncensored information*" were more prevalent in men (Colley & Maltby, 2008, p. 5). The COVID-19 pandemic has brought more attention to the negative consequences of gendered digital exclusion, such as limited access to work and education, information, online public services and other opportunities (Acilar & Sæbø, 2023).

According to Petrosyan, 2023, Europe has the largest proportion of Internet users in the world, with 89 per cent of the female population and 90 per cent of the male population using the Internet. At the same time, the biggest gender digital divide can be observed in Africa, where only 34 per cent of females use the broadband network. From Figure 1 it follows that disparities between the Internet access rates of males and females vary across different regions. Even though there are significant improvements in the gender digital gap, the obstacles are still persistent and need to be carefully examined, particularly in the least advantageous regions. Some researchers suggest that COVID-19 has been a driver for bridging the gender digital divide, where females have become more interested in technology and online learning as organisations have
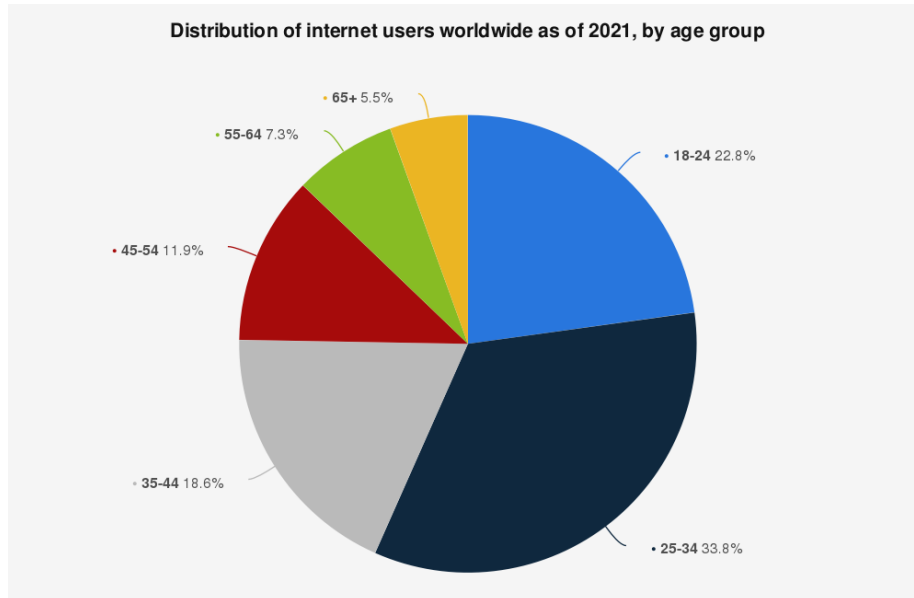
Figure 2   Age Distribution of Internet Users Worldwide 2021 (Petrsoyan, 2023)

begun to offer free courses and events to encourage participation in the digital world (Mathrani et al., 2022).

Another critical factor shaping the digital divide is a person's age (Elena-Bucea et al., 2021). There are more and more older people around the world, but their use of ICT lags behind that of other age groups. One simple reason for that could be that over the past decade jobs have moved to hybrid modes and everyday life has become increasingly virtualized, making it difficult for older individuals to embrace new digital opportunities. Research by Noce and McKeown, 2008 showed that elderly were more reluctant to accept new technology. The hesitation to use these resources has been primarily due to a lack of interest, fear of anonymity, lack of security, and fear of making a mistake when using programs.

As such, some empirical evidence highlights the significance of this social determinant. According to Petrosyan, 2023, as of 2021, 56.6 per cent of Internet users fall within the age group of 18-34 (Figure 2). As noted by various scholars (Balki et al., 2022; Czaja et al., 2006), the elderly face a certain set of obstacles and barriers, which include the disappearance of past familiar professions, lack of interest and confidence in mastering new technologies, and psychological pressure to integrate into the digital world. These factors only increase inter-generational inequality in all spheres of life; older people risk many things, from job loss to a general decline in the quality of life. A prominent German sociologist Schleife, 2010 explained further how a person's family composition may affect their ability to use ICT. In particular, the use of the Internet by children increased the likelihood that other family members would use the Web. In her study of German households, the author concluded that many older

individuals have problems accessing digital technologies, and they may feel insecure and helpless when confronted. This can lead to them not being able to take advantage of new opportunities and services that are only available digitally. On top of that, the digital age gap can exacerbate other forms of social inequalities, such as racial and class inequalities. The elderly tend to have lower incomes, less stable employment and weaker connections to the technological community, which can lead to their even greater exclusion from the digital sphere and public life in general.

Thus, in a technology adoption study by Vannoy and Palvia, 2010, the authors have found that age plays an important role in technology adoption decisions as well. They noted that the younger generation tends to embrace ICT more quickly than the older and that the latter may have greater difficulty adopting new technology all in all. However, the authors also pointed out that age is not the only factor influencing technology adoption decisions. Scholars highlighted how other indicators, such as experience with technology, level of education and income, also play an important role in decisions about the integration of ICT. As such, it can be concluded that age alone is not the determinant of whether an individual will be in favour of adopting technologies in daily life.

By the end of the 20th century, the Social Shaping of Technology (SST) was introduced in the literature as a scientific concept in the terminological toolkit of the sciences (R. Williams & Edge, 1996). Thus, the theory explains that under the conditions of socio-cultural changes, social technologies aiming at shaping public consciousness can have a different impact on the reform process, determining the non-linear development of society and the historical process. In the framework of SST, *social technology* is not considered as a rigid algorithm of social interaction and is a way of social construction and formation of discrete historical consciousness, in order to meet the needs of the subject of technology, implementation of its potential abilities and interests. The theory primarily argues that technology affects society through opportunities, constraints, preconditions, and unintended consequences (Howcroft et al., 2004). Affordability is the idea that technology facilitates specific tasks in our lives, while constraints make tasks more difficult. According to SST, it is not only technology that affects society, but vice versa as well - through economics, politics, and culture.

An analysis of the scholarly writings has highlighted the widest possible range of discussions on the subject of the digital divide. Approaches to address the objective of the digital divide are based on the principles of interdisciplinarity, where technological, economic, environmental and social aspects collide. Taken together, the factors that shape the digital divide affect individuals' possession of vitality, i.e.

those opportunities for individual development that are provided to the public by the state, civil society institutions, and economic organisations (McNamee, 1982). These resources can be innate or arranged by social institutions. The advantage of possessing the essential resources directly affects the position of an individual within society, hence, it is a factor in the formation of equality. On the basis mentioned above, different Internet lifestyles form digital inequality. Nevertheless, some digital inequalities are also emerging that do not coincide with pre-existing imbalances, but rather reflect individual experiences of digital technology use. Researchers began to consider the digital divide as a complex social challenge that includes different types and forms of the digital divide - from traditional economic to cultural and anthropological (Ragnedda & Muschert, 2013; Vartanova & Gladkova, 2019). As van Dijk, 2005, 2013, 2020 carefully pointed out in his several studies, the digital divide is not only about access but also about the ability to use new technology. As such, sustaining individual's digital capabilities through policies and regulations is as crucial as providing the required infrastructure.

2.1.3 Promoting E-Government and Bridging the Digital Divide

Studies discussed previously have demonstrated that the digital divide is not only a problem for individuals, but for countries and regions globally (Warschauer, 2003). The availability of ICT resources and access to broadband networks is not the sole solution - the ability to use these resources plays an important role in establishing an information society and addressing digital inequality (van Dijk, 2006). Today, T. O'Reilly's idea of the state as a platform for ongoing monitoring of open data and the algorithmic regulation of public policy based on it is beginning to gain support in many countries (O'Reilly, 2010). The emergence of e-government occurred in most countries of the world, both developed and developing, and the main reason for the demand was the introduction of ICT in the activities of public authorities making it possible to significantly reduce the cost of maintaining the structures of executive power (E. Abu-Shanab & Khasawneh, 2014; Moreno-Enguix et al., 2019). As we come across a *digital revolution*, governments around the world have begun to embrace technologies in public administration, launching websites to improve the efficiency of public service delivery. Much attention is being paid to improving the information training of civil servants, due to the need to restructure the system of professional development (Kerr & Khatiwada, 2021; Puja Nugraha & Dwi Susanto, 2022). The question arises whether civil servant training is sufficient to address the digital divide, or whether ordinary citizens are able to use these services without knowing or having the necessary tools and knowledge. While for some countries, the development of a digital state presents progress, for others it is a trend that includes the threat of

Country	Region	EGDI (2022)	EGDI (2020)
Denmark	Europe	0.9717	0.9758
Finland	Europe	0.9533	0.9452
Republic of Korea	Asia	0.9529	0.9560
New Zealand	Oceania	0.9432	0.9339
Sweden	Europe	0.9410	0.9365
Iceland	Europe	0.9410	0.9101
Australia	Oceania	0.9405	0.9432
Estonia	Europe	0.9393	0.9473
Netherlands	Europe	0.9384	0.9228
United States of America	Americas	0.9151	0.9297

Figure 3   Highest EGDI Countries (UN DESA, 2022)

global catastrophe. The digital divide is a multifaceted phenomenon that exists at many levels, from the individual, society, corporations and regions to the global level. Indeed, a major cause of the digital divide is the uneven distribution of ICT resources around the world. In the wake of ICTs governments are encouraging citizens to access and use public services via the Internet (E. Abu-Shanab & Khasawneh, 2014). Open government initiatives are being adopted worldwide to boost a continuous stream of digital services. The e-government system is not just a technical solution, but an information environment in which hundreds of different organisations cooperate, services are provided and used, and their successful interaction requires, above all, legal acts governing the relationships within the system.

A study by Lee-Geiller and Lee, 2019 contributes to the scholarly literature by expanding the scope of website analysis of e-government beyond the question of citizen acceptance to the question of civic engagement and bringing the public as active agents in governance. This provides a holistic model of government websites, which promotes democratic electronic governance. Nowadays, each country's ability to compete depends on its ability to effectively use ICT (E. Abu-Shanab & Khasawneh, 2014). Foreign experience shows that these processes serve the sustainable development of every country. It is these technologies that are considered to be the main and reliable tools for effectively solving various problems existing in the current socio-economic situation of the population and reducing the level of poverty.

Figure 3 shows ten countries with the highest E-Government Development Index (EGDI) published by the United Nations Department of Economic and Social Af-

fairs (UN DESA, 2022). The indicators used for calculating the score are combined and as a final result range from 0 (being the smallest) to 1 (being the largest). The e-government assessment indicator includes a broad range of data that provides the most comprehensive reflection of the level of development of public administration (Osman & Zablith, 2021). The information is sourced both from major international organisations and from surveys that are conducted within countries. According to a study (UN DESA, 2022), as of 2022, Denmark has the highest EGDI score (0.9717), while the United States is holding 10th place (0.9151). It is generally believed that innovations in telecommunications and information processing technologies have an impact on the delivery of public services (M. J. Moon, 2002). One of the main priorities for nations is to achieve greater efficiency in the provision of public services, and e-government is one of several strategies being used by governments. Several studies confirm a significant correlation between the level of development of e-government and the efficiency of public service delivery, both in general and by function (Moreno-Enguix et al., 2019).

Overall, the COVID-19 pandemic has given a strong impetus to digital development. Drones with loudspeakers have appeared on the streets of Chinese provinces, as well as thermal imaging drones that can remotely determine a person's body temperature and report it to medical facilities (Deng et al., 2022). One of the COVID-19 crisis's most significant side effects has also been the widespread use of technical tools to track the virus's progress and citizens' physiological conditions. Meanwhile, in the interest of public health, the data could be made available to private companies due to the value gathered for the healthcare providers and pharmaceuticals. Thus, in comparison with the previous report made in 2020, considerable improvements can be observed for each country on the list (Figure 3). Digitisation is gradually being introduced in public administration, which creates the need for a new evaluation of the effectiveness of the management system in every country. Thus, the current situation and level of development of ICT application are considered one of the most important indicators of the intellectual and scientific potential of each country, ensuring transparency in the management system and developing democracy as a whole (Basu, 2004). Research has shown that countries with higher levels of e-government tend to have lower levels of the digital divide index, as e-government services can help bridge the gap between different groups of people in terms of their access to digital technologies (Heeks, 2002). Conversely, countries with low levels of e-government tend to have higher levels of the digital divide index, as those who lack access to digital technologies may also have difficulty accessing e-government services (M. J. Moon, 2002).

The pursuit of economic sustainability by different states should have the basics of e-government to support effective and efficient governance through whole-of-government

- an integrated approach to public sector management using ICT (Othman et al., 2020). Hierarchical bureaucratic structures need to be transformed into horizontally integrated systems that foster client orientation and increase transparency and accountability in the delivery of public services. Given the basic aspects of e-government, scholars also focus on several other parameters that should be taken into account when implementing digitisation projects in countries with an existing digital gap. These factors include cultural, organisation and infrastructural aspects such as technology readiness; user habits and literacy; citizen engagement and more (Bekkers & Homburg, 2007). This implies that there is a significant proportion of the population willing and able to accept and use e-services and that the organisational and technical prerequisites for implementing e-government applications must be in place to meet the needs of citizens. According to many scholars (Bilbao-Osorio & Rodríguez-Pose, 2004; Dimaggio & Hargittai, 2001; Warschauer, 2003), the implementation plan of e-services can be based on shared resources. The public sector can take advantage of its social impact as well, as the offer of services both via service points e.g. Internet cafes and via shared devices such as ATMs can significantly improve service delivery. The success of such implementation may depend, in particular, on the accessibility of the hardware and software platform for citizens experiencing difficulties due to the digital divide; but in addition, the use of dedicated service facilities with secure access to personal data and services as guaranteed by the state eliminates the posed problem of lack of infrastructure or existence of trust and security risks (M. J. Moon, 2002).

While some countries have a high literacy rates and significant Internet and computer technology access, many other still maintain well-established cultural norms where people prefer to communicate with each other or deal with important matters in person rather than over the Internet (Hargittai, 2010). The application of e-government in such communities tends to be limited to the need for face-to-face communication. As such, a large proportion of innovative changes face one or another initial resistance. From the Industrial Revolution until the Information Age, in both the financial and technical spheres, innovation in procedural and production processes has been perceived by employees as something of a nuisance (Contreras et al., 2022; Makkonen & Olkkonen, 2017).

A characteristic trend of the current development of digitisation in the state-legal sphere is that governments provide more and more information to the public (O'Reilly, 2010). As such, public data portals offer legal policy programmes in various areas of socio-economic development; information on public expenditure and the budget; and online services related to education, employment, health, social protection, justice and legal advice. However, the digital divide between countries persists globally,

including the 33 African least developed countries (Akiwumi, 2022). The divide, however, does not only exist between various states - it often develops within different segments of the country - concerning various citizens and social groups. According to Ranchordás, 2020, the current principles of digital government resource formation may have consequences such as the digital exclusion of citizens, which amounts to unequal access to public services. As outlined by Reglitz, 2020, it is fair to state that everyone has a right to access and use the Internet. However, in contemporary international law, the right to access the Internet is not regulated autonomously - but is defined as part of the human right, i.e. equality for all citizens, to participate in the information society. The digital divide should thus be assessed not only as a kind of inequality that prevents individuals from having access to digital technologies but as a more complex set of issues, not limited to providing mere access to the relevant infrastructure.

The emergence of a *digital citizen* with sustainable skills and the ability to regularly, critically and securely interact with public administration in a digital environment has been put on the agenda - particularly in developed countries with an increasing range of online public services characterised by complex user requirements (Isman & Gungoren, 2013). UNESCO reports already in 2015 defined *digital citizenship* as a set of skills that enable citizens to access, retrieve, understand, evaluate, use, create, and share information in all formats, using various tools, critically, ethically and effectively participate in private, professional and public activities (Fernández-Prados et al., 2021).

The approaches that exist and are developing in various countries worldwide to overcome the digital divide are, however, clearly insufficient. A positive example of overcoming the digital divide is the policy framework in the United Kingdom and Denmark, whose governments have begun to develop the concept of digital assistance programs to guarantee citizens' equal access to and use of online public services Ranchordás, 2020. The programs are used to refer to a wide range of policies and applications aimed at ensuring that all citizens, without exception, can make full use of the resources arising from the transition to digital government formats. Further, according to Ranchordás, 2020, the digitisation of services and administrative decision-making within electronic governments can reduce errors and biases on a managerial level.

However, automated systems cannot make human exceptions to the general rules based on personal experience, compassion or the belief that a given citizen, in a particular case, may deserve differential treatment based on the specifics of a particular personal situation e.g. low literacy level. Thus, with the growing trend towards

digitisation of information and automation of public services, public authorities often forget that not every citizen has the ability to interact effectively and critically with technology (Ranchordás, 2020; van Dijk, 2020). Citizens should be guaranteed access to public services - without having to deal with technology - and as long as this remains possible in the alternative of online public services. The author also stresses that digital government is not an end in itself, but a means to make public administration more transparent, efficient, accessible and inclusive.

Thus, addressing the digital divide is essential to provide every citizen with access to online public services, including public benefits; especially for the development of online service formats for social assistance and welfare measures. The automation of such services, which cannot be fully or critically perceived and used by citizens with limited digital skills, ends up generating unequal treatment and entails violations of citizens' rights. Nevertheless, several scholars (Colesca & Dobrica, 2008; Helbig et al., 2009; Ranchordás, 2020) believe that the design of government online services cannot be developed only with the capabilities and skills of digital citizens in mind. For these reasons, the implementation of e-services should be carefully considered and addressed as the goals of continuing to improve efficiency and service delivery may have a direct impact on the digital divide in the country.

2.2 Digital Transformations in Post-Soviet States: A Review of Progress and Challenges

Twenty-seven years have passed since the collapse of the Union of Soviet Socialist Republics (USSR), which provoked mixed reactions in various parts of the capitalist and socialist world (Dabrowski, 2022). The fifteen socialist republics that made up the union have been replaced by the same number of independent states that have emerged. As industrialisation once did, digitisation in the former Soviet countries was a stage in technological progress and required the state system to serve its needs (Mussagulova, 2021). Over the last decade, post-Soviet countries have launched a growing number of e-government initiatives aimed at increasing the efficiency and transparency of public administration and improving interaction with citizens (Knox & Janenova, 2019). Undoubtedly, ICTs are increasingly seen as important tools to promote transparency and accountability as well as to detect and reduce corruption. New technologies in the form of websites, mobile phones, and apps are being used to facilitate reporting of corruption and access to official data, monitor the effectiveness and integrity of social services and the political life of the country, and increase transparency in financial information. Post-socialist states vary greatly in their levels of e-inclusion. As such, a brief literature review on countries' digital transformations is presented below.

The **Estonian** experience is particularly interesting given the earlier application of the digitisation mechanism. According to Goede, 2019, by 1998 all schools in Estonia were connected to the Internet and in two years Internet access was raised to the human rights level. As scholars note (Margetts & Naumann, 2017), independence has contributed to the exceptional credibility of the national government, which has proposed a digital growth strategy and a state ideology based on innovative development. The country is recognized worldwide as having one of the most advanced digital technologies, associated with a model of digital governance incorporating e-government, e-voting, e-banking and e-health (Goede, 2019). Election organisers around the world know Estonia as the country where Internet voting was first used in the 2007 national elections - now Estonian voters can vote via the Internet in European Parliament, and state and municipal elections. Estonia also has a strong focus on digital security, with one of NATO's most important cyber security centres in Tallinn.

Some scholars (Jermalavicĭus & Marmei, 2018; Mole, 2012; Traşca et al., 2019) state that entering the European Union (EU) in 2004 gave Estonia, Latvia and Lithuania a sense of belonging, this time voluntarily, to a larger cultural and economic space - which is part of the reason why they are ahead of other post-soviet states in the global charts. Analysing the Baltic States based on the Digital Economy and Society Index (DESI) indicators, it can be concluded that all three countries have advanced in aspects such as Internet connectivity, use of the Internet and digital public services (EC, 2022c). **Latvia** has come a long way since regaining its independence in terms of economic development and statehood. According to the "Going Digital in Latvia" report (OECD, 2021), the number of e-government users continues to grow in the country and the quality of online public services is constantly improving. The country's level of development is in line with the EU average, but as more and more people in Latvia are using Internet banking and e-governance services, half of the inhabitants have low or no digital skills. According to the DESI report (EC, 2022a), 51 per cent of the population aged 16 to 74 has at least basic digital skills and only 24 per cent have above basic digital skills. Moreover, Latvia is in the 20th place among all 27 member states when it comes to the connectivity index i.e. the broadband network coverage across the country. **Lithuania** has gained its independence at the same time as two other Baltic states. The country holds a quite similar outlook in comparison with Latvia when it comes to its digitally skilled population - almost half of the residents possess basic digital skills, while only 26 per cent hold above basic digital skills (EC, 2022b). On the other hand, in terms of digital public services the country ranks 10th, which is well above the EU average. All three Baltic states were stated to be "the least Soviet" (Siegelbaum, n.d.) among the fifteen republics, which may be the reason for their fast recovery from the *post-socialist past.*

Country	EGDI Rank	Region	EGDI (2022)	EGDI (2020)
Estonia	8	Europe	0.9393	0.8509
Lithuania	24	Europe	0.8745	0.8253
Kazakhstan	28	Asia	0.8628	0.6977
Latvia	29	Europe	0.8599	0.8169
Russia	42	Europe	0.8162	0.7257
Ukraine	46	Europe	0.8029	0.6152
Belarus	58	Europe	0.7580	0.7266
Georgia	60	Asia	0.7501	0.6942
Armenia	64	Asia	0.7364	0.5972
Uzbekistan	69	Asia	0.7265	0.5142
Moldova	72	Europe	0.7251	0.6009
Kyrgyzstan	81	Asia	0.6977	0.4568
Azerbaijan	83	Asia	0.6937	0.6401
Tajikistan	129	Asia	0.5039	0.3531
Turkmenistan	137	Asia	0.4808	0.2649

Figure 4   E-Government Development Index for Post-Soviet Countries (UN DESA, 2022)

In the mid-90s, the **Russian Federation** went through visible signs of change in its Internet and digital media, when ICTs began to penetrate large industrial cities in the European part of the country, and years later digital technologies became widespread (Vartanova & Gladkova, 2019). The collapse of the Soviet Union led to a demographic crisis in Russia, where a natural increase was replaced by a decline in population due to a fall in the birth rate and a simultaneous rise in mortality. To better frame the level of digitisation among the Russian population, studies were put forward by domestic scholars. Ergunova et al., 2019 demonstrated that several challenges still need to be solved if the country wants to digitally transform such sectors as finance, transportation, logistics, e-government, etc. A worldwide trend of the digital divide between generations was observed in Russia as well but seemed to be shrinking over the years: as such, according to data from the Federal State Statistics Service, 2022, in 2017, people aged between 15 to 34 accounted for the largest share (50.7 per cent) of Internet users, but by the end of 2021 this indicator has fallen to 37.7 per cent. Additionally, the proportion of the Russian population who have used the Internet to access state and municipal services has also increased year by year, accounting for 71 per cent of the whole population by 2022 (Federal State Statistics Service, 2023). Modern ICT is being systematically introduced in the constituent entities of the Federation, and the tools of e-government are increasingly in demand by citizens (Kravchenko et al., 2021). More than a year after the imposition of sanctions and the departure of vendors as a result of Russian-Ukraine war, the IT industry continues to show growth in sales volumes through increased investment in domestic software, an increase in IT services (development, maintenance; IT system support) and demand for Russian cloud infrastructure (IaaS) (TAdviser, 2023). Even though the authorities

have paid increased attention to digitisation and technological advancements, as the Russian economy is fenced off by sanctions, these global plans have become somewhat worthless as almost every national sector has become a particular risk factor (Adam & Keijer, 2023).

Through the contributions of the development and strengthening of IT, and with the transition to another level of social development, it is believed that an information society has taken shape in **Uzbekistan** (Turdiev et al., 2020). According to Shin et al., 2020, the country's improved position is due to financial investments in Internet access infrastructure and the involvement of international experts, the simultaneous launch of several electronic platforms, including open data and housing and utilities web portals, a system of public discussion of draft legal and legislative documents, and others. Uzbekistan has adopted the "Digital Uzbekistan 2030" strategy, the main goal of which is the successful transition to a digital economy (Turdiev et al., 2020). Scholars cite factors that hinder this digital transformation, which include a shortage of highly qualified personnel; a lack or low level of knowledge and competence among employees of enterprises; a lack of opportunities to integrate existing and new technologies; and more threats. **Tajikistan** has already seen the benefits of a developed ICT sector as well - from the early 21st century, the field was one of the fastest growing in the country, contributing to socio-economic development and, indirectly, to the growth of state budget revenues (ITU, 2017). Through transparent licensing procedures and low licensing fees, Tajikistan has effectively converted the relative weakness of its economy - low Internet penetration - into an ability to attract international operators. The National Development Strategy of the Republic of Tajikistan 2030 has made significant leaps in the area of anti-corruption as well (Burieva et al., 2022). The government prioritises institutional development towards ensuring effective, transparent anti-corruption management and financial control based on the introduction of ICT at all levels of government. Nevertheless, Reyaz, 2020 highlights that nowadays Tajikistan yet again suffers from limited access and high prices for Internet services, especially in rural areas.

Over the years of independence, **Kazakhstan** has come a long way towards developing its model of social well-being (Knox & Janenova, 2019). Having studied the experience of different countries in digitisation, the state program "Digital Kazakhstan" was adopted by the Decree of the Government dated December 2017 (Petrenko & Shevyakova, 2019). The objectives of the state programme are to accelerate the development of the economy of the Republic of Kazakhstan and improve the quality of life through the use of digital technologies in the medium term; as well as to create conditions for the transition of Kazakhstan's economy to a fundamentally new development trajectory, which ensures the creation of the digital economy of the future in

the long term. As of 2022, the country was ranked 15th in the E-Participation Index (Figure 4), one of the strongest indicators of digitisation in the world (UN DESA, n.d.). An important step was the digitisation of many public services, in customs and tax administration, and court proceedings; in Kazakhstan, these measures have led to the effective application of digital solutions in improving the quality of services and reducing the level of domestic corruption. Despite these achievements, the potential for development and improvement is quite high and further social modernisation involves adapting the economic, and social aspects to the requirements and standards of the modern world (Bekenova et al., 2021).

The collapse of the USSR had a challenging effect on the economy and society in the **Republic of Armenia** as well (Ishkanian, 2009). According to data (ITU, n.d.), the proportion of the population using the Internet in Estonia and Armenia is 89 and 77 per cent, respectively. According to the analysis made for the "Digital 2023: Armenia " report (Kemp, 2023a) Internet users in Armenia decreased by 0.2 per cent between 2022 and 2023, suggesting that some 21.4 per cent of the population remained offline at the beginning of the year. The country launched its e-governance development project in 2012 while following a successful example of a similar program led in Estonia. The results of the report by ITU (Garnett et al., 2021) show that today Armenia does not practise a fully developed model of digitisation, but maintains its efforts in the direction of its formation. Similarly, the current policy of the **Republic of Belarus** in the field of digitisation defines the main directions of activities of state bodies and other organisations to ensure competitiveness and innovative development of the national economy through the introduction of advanced ICT, improvement of public administration system and development of information and communication infrastructure. Analysis of the EGDI (Figure 4) shows that in 2022 the Republic of Belarus has entered the subgroup of countries with a high e-government index value, ranking 58th overall, but still lagging behind digitally successful post-Soviet countries. Nevertheless, the Internet of Things (IoT) is used in urban infrastructure management of Belarus i.e. smart traffic lights, transport i.e. electronic fare collection system; and in various industries (Kamenets, 2020). In recent years, the authorities have paid increasing attention to digitisation processes in Kyrgyzstan (Reyaz, 2020). To date, all services in the state registration service system have been converted into electronic format. A roadmap has been approved for the development of a digital **Kyrgyzstan**, which contains tasks in all spheres of society and the state, including the digitisation of infrastructure, the socio-economic sector, public administration, law enforcement, and the judiciary (EC, 2021). In addition, there is active outreach to improve digital accessibility, including in the area of public services. According to the research for the UNDP Project (Soltobaev, 2020), a vast majority of residents in

Kyrgyzstan hold the necessary digital skills but many suffer from access to Internet networks or simply having the infrastructure.

Georgia's digitisation policy began in the mid-2000s, which correlates with the country's lower ranking worldwide (ITU, 2021). The EGDI indicator (Figure 4) shows that Georgia, even though still lagging behind global trends in the growth of digitisation, has a relatively high index (0.7501) compared to other post-Soviet countries. Georgia's digitisation policy began in the mid-2000s, which correlates with the country's lower ranking in the global indexes (Chaligava, 2018). A distinctive feature of the one-stop-shop model in Georgia is the clear division into back and front offices in the government service delivery chain. The Public Service Centre and Community Centres serve as front offices for the back offices of those agencies responsible for developing public services. Additionally, according to Transparency International, 2023 Corruption Perceptions Index (CPI), the Georgian government has a considerably low (56 out of 100) level of public sector corruption. As simply as(Sheryazdanova et al., 2020, p. 7) put it:

> Despite the fact that electronic public services are not the only way to reduce corruption, they are one of the important preventive measures to reduce corruption risks.

Meanwhile, the seven-year regional development strategy of **Ukraine** has a strong focus on digital transformation. Although in comparison with the regional ranking Ukraine's 46th place in EGDI (Figure 4) is not the best indicator, the country improved its ranking throughout the years. According to the "Digital 2023: Ukraine" report (Kemp, 2023d), Ukraine's Internet usage rate stood at 79.2 per cent at the beginning of the year, considering that the country's population decreased by 7.3 million between the years 2022 and 2023. According to the Digital Transformation for Ukraine project (Delegation of the European Union to Ukraine, 2023), funding will be used to develop digital services, improve data exchange between registries and government agencies, develop e-identification infrastructure, and improve the electronic management of criminal cases. At the beginning of the 2023 the country also launched the mobile application "Diia", the main concept of which is the ability to obtain public services online. More than 80 public services are already available online and have been crucial in terms of citizen access to services during the Russian-Ukraine war. It is safe to say that Ukraine is still harvesting digital dividends despite the war (Ionan, 2022). The government is currently working on its 2030 vision for the automation of all public services, and accomplishing "quick and bold" reforms for its digital industry.

ICT has become an integral part of the **Republic of Moldova** (Grecu & Dicusar, 2021). The country was one of the first states in Europe to implement a technology platform - the government cloud, which allows the hosting of several government information systems (Bogatencov et al., 2012). Surprisingly, Moldova is still behind many post-Soviet countries, having an e-government index of 0.7251 (Figure 4). Developed with the help of the EU, Moldova published its digital transformation strategy for the years 2023-2027, the aim of which is to create a dynamic and inclusive digital society in the country, with a developed technological infrastructure, digitally savvy citizens, and businesses that use digital opportunities to drive innovation and human development (eGovernance Agency, 2023). The single platform of public services was launched in the early 200s and represents a one-stop shop for public services provided by public authorities. The portal "servicii.gov.md" operates as an electronic catalogue of public services provided by public authorities for citizens and businesses (Grecu et al., 2017).

Lastly, out of all Soviet countries, **Turkmenistan** holds the last place for its EGDI Index (Figure 4). Although the country's neutral status and advantageous geographical and geopolitical position have contributed to its leadership in the stabilisation processes taking place in the region after its partition from the USSR, the challenges countries face today are becoming ever more complex, influenced by a variety of financial and economic situations around the world that are linked to new opportunities for high-level advances in technology (Nazarov & Jumayev, 2021, 2022; Peyrouse, 2015). Currently, Turkmenistan is in the process of digitising all spheres of the national economy and introducing scientific developments into production. As published in the country's official government press of the Cabinet of Ministers of Turkmenistan - Neytralny Turkmenistan (Alimova, 2022), in July 2022 the President signed the Law of Turkmenistan on Electronic Government, which serves the establishment of procedures for e-government development and is designed to facilitate the implementation of the Digital Economy in Turkmenistan. Despite attempts at progress in the least developed post-Soviet country, this is still no indicator of successful digital transformation. According to Digital 2023: Turkmenistan (Kemp, 2023c), at the start of the year, the usage rate of the Internet stood at only 38.2 per cent, meaning that roughly 4 million residents were disconnected from the broadband network.

The comprehensive development of digital technologies is becoming a driving force for innovation and economic growth for post-USSR countries. It is necessary to assess the effectiveness of the use of best practices by governments for social progress, especially in low- and middle-income countries (Choi & Park, 2019, p. 111). It is safe to establish that digital development has embraced all the republics of the former Soviet Union, however, the transformation is uneven and the institutional environment for digital

technology remains episodic for individual countries. The main challenge remains to develop a balanced approach that maximises the positive effects and minimises the risks of the web economy: unemployment, social inequality, security, social exclusion, etc. As seen today, the well-being, comfort and security of citizens are simply not possible without the state's transition to digitisation. The example of more developed countries from the post-Soviet Union, which have already gone down this road, shows that the implementation of digitisation of the state somewhat helps reduce corruption, improve the quality of life and increase the level of the economy.

2.3 Theoretical Framework for Digital Divide: The Unified Theory of Acceptance and Use of Technology

As studies (F. D. Davis, 1993; Koul & Eydgahi, 2017) show, the introduction of ICT in the public sector is not the result of grassroots effort but rather a top-down management initiative, so user activity may be lower than expected due to organisational culture. The need, therefore, arose to develop tools to achieve the required level of activity of both citizens and employees at all levels of the government hierarchy in adopting and using new digital tools, especially today, when interactivity of use is one of the critical conditions for their successful functioning (Lee et al., 2011; Nam, 2014). There are many well-known research models used for IT systems adoption that have identified factors influencing the human intention of technology usage, and how and why people choose new information systems (Koul & Eydgahi, 2017). According to Varpio et al., 2020, the main aspect of any research is the theory itself, and the frameworks to define its distinctive identity. Frameworks are also a prerequisite for research; data collection without theory is not research, but observation or review of commonly used theories in IT research, especially related to technology use, the positive and negative properties of each of the theories used must be considered.

The Unified Theory of Acceptance and Use of Technology (UTAUT) is a framework developed originally by Venkatesh et al., 2003 that seeks to explain and predict the factors that influence individuals' acceptance and use of new technologies. According to Alomary and Woollard, 2015, the foundation for its creation was several methods, such as the Theory of Planned Behaviour (Ajzen, 1991); the Technology Adoption Model (F. Davis, 1987); the Diffusion of Innovations (Valente & Rogers, 1995) and more. The original models of acceptance were developed for situations where users could choose whether or not to use the technology. This was reflected in the operationalisation of the acceptance construct: an individual adopts a technology if he or she intends to use it. Additionally, it was also suggested that acceptance of technology should be defined as the user's attitude towards its use, especially in the case of compulsory use. According to Madigan et al., 2017, UTAUT is widely used
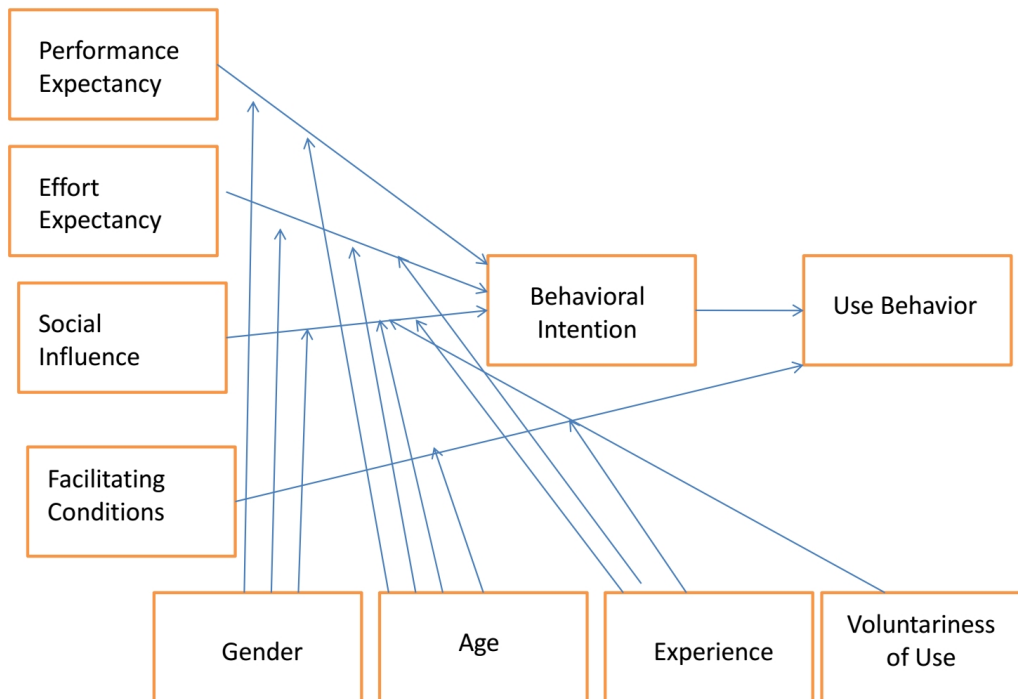
Figure 5 The Unified Technology Acceptance and Use of Technology Theory (Venkatesh et al., 2003)

in the study of mobile banking systems, electronic government services, transportation technologies, and mobile applications; therefore, is a better choice for studying sociological reasons for the digital divide.

As the foundation of the UTAUT (Figure 5) theory was adapted to a sample of office workers, the authors of the model suggest that it should be further explored in terms of its applicability to different technologies, user groups and organisational contexts, which may contribute to the generality of the model: change the relevance, strength and direction of the links (Venkatesh et al., 2003). The basic model identifies factors such as performance expectancy, effort expectancy, social influence and facilitation conditions as important predictors of technology acceptance and use. Moreover, the framework drives the goal of this research to create a technology adoption model that can demonstrate user behaviour in the use of e-government technologies and applications.

1) *Performance Expectancy* - is defined as the degree of confidence and belief that using the technology will improve the overall performance;

2) *Effort Expectancy* - is a measure of a person's confidence in how easy it is to learn the technology;

3) *Social Influence* - or the extent to which the individual believes he or she is important in his or her social environment and should use the technology;

4) *Facilitating Conditions* - including support, infrastructure, knowledge and the degree of confidence the individual has in the organisation where he or she works to ensure that there is sufficient support for staff to use the technology.

UTAUT argues that the highlighted components are positively correlated with *Behavioural Intention*, which, in turn, contributes to the actual *Use Behaviour*. Similarly, F. Davis, 1987 states that people's tendencies to use IT will vary depending on the perceived usefulness; or performance expectancy in the case of UTAUT. For example, if a person thinks that the application they are using helps them to do their job better, it can be said that their intention to use the application will increase. Venkatesh et al., 2003 further suggest that *Gender, Age, Experience* and *Voluntariness of Use*, moderate the associations between predictors of technology adoption. As such, these factors might be more present in particular groups of individuals with greater access to technology, such as those with higher levels of education or income. Furthermore, the framework assumes that people have equal access to technology, which may not be the case for marginalised groups who lack access to digital technologies. Similar to the relationship between people, attitudes towards new technologies can be seen as more or less trusting (Li et al., 2008). Trust in technology is understood as a specific psychological attitude of an individual, expressing his or her perceptions, emotional reactions and readiness to perform professional tasks with the help of technology. As research by Wu et al., 2011 shows, trust in technology can vary in terms of its reliability, i.e. its stability as well as in terms of the individual's assessment of his or her ability to operate it. However, given that technophobes cannot completely rule out the use of technology, it must be assumed that the attitude towards technology as socially dangerous can be combined with a high assessment of one's ability to use it.

To further analyze the behavior of individual users of ICT, the UTAUT 2 has been expanded by factors of *Price*, *Hedonic Motivation*, and *Habit* (Chang, 2012). Research suggests that attitudes towards new technologies are closely related to motivation, the expected utility of the technology, financial affordability, usage goals and habits (Brown & Venkatesh, 2005; Nam, 2014; van Der Heijden, 2004). The study by Beaudry and Pinsonneault, 2010 found that emotional experiences were found to have a significant effect on willingness to use IT, but the direction of this influence depends on its social meaning. For example, feelings of pleasure reduce willingness to explore new technology; anger about new technology has an indirect positive effect on willingness to use it since it accelerates learning; and anxiety about new technology has a similarly contradictory effect. Cross-cultural differences in attitudes towards ICT have been found as well; in particular, long-term orientation reduces the perceived difficulty of mastering technology, individualism weakens the influence

of significant others on attitudes towards technology, and *masculinity* of culture increases the importance of the expected benefits of using technology (Nistor et al., 2013).

William T. (Waller, 1987, p. 2) was truly ahead of his time when discussing the theory of *ceremonial encapsulation*, where he describes the innate conservatism of social structures towards the integration of technological innovation. The scholar explored the limitations in adapting technology to pre-existing institutional structures and how ceremonial values remain inert, even reversed, despite the pull from new technology towards progress and efficiency. The focus on the conservatism of institutional structures and the values that inspire them provides important insights into the mechanism of institutional restructuring and socialisation of technological innovation (Calhoun, 2004). Therefore, at the level of society as a whole, the mechanisms of technological encapsulation prevail, with a broad reach - traditions, habits, institutions, and the division of labour encompassing everyone. As noted by F. D. Davis, 1993, the attitudes on which people make decisions to use information systems are influenced by a variety of contextual factors and individual characteristics, the identification and differential analysis of which may allow software developers and system designers to determine the choice of functionality and interface characteristics and be more focused in its design.

As such, the formation of attitudes toward new technologies depends on a variety of psychological and socio-demographic factors. Technology access and adoption is a multifaceted phenomenon that has been the subject of numerous studies aiming to comprehend its various dimensions. Nevertheless, all above-discussed technology adoption theories agree that the digital divide should be examined on an individual or country-specific basis rather than as a blanket term.

3 Research Methodology

The main purpose of this chapter is to provide a clear and detailed description of the methods and procedures used in the study, to ensure the reliability and validity of the results. The author's comprehensive and systemic approach to the digital divide formed the methodological basis of the dissertation paper. The chapter is divided into several sections, beginning with a description of the problem and the general research design, followed by an exploration of the data collection methods and tools. The description of the process of data analysis is included as well, such as the choices of software and techniques used to analyse the data. The focus of this research is on the case of Azerbaijan.

3.1 Research design

Sociological research is a system of logically consistent methodological and organisational procedures, with a single objective: to obtain accurate and objective data about the object, phenomenon or process under study (Devine & Heath, 1999). According to Goundar, 2012 the research method that has been chosen appropriately successfully answers posed scientific problem. As such, a qualitative methodology is utilised in this research to investigate and analyse the causes of the digital divide problem and evaluate the policy options of it. An in-depth analysis of the case (Gerring, 2012) allows us to comprehend the threats and opportunities for citizen participation in e-government by examining how Azerbaijan established its digital government sector. Several scholars (Denzin, 2007; Morse, 1991; Patton, 1990) note the growing interest in qualitative methodology in the early 90s due to factors such as the natural progression of scientific thought, the enrichment of theoretical ideas and methodological assistance for researchers. Qualitative methods involve a non-mathematical analytical procedure, the results of which are derived from data collected in different ways and from different sources such as transcripts of interviews, discourses, protocols of observations, videotapes, and documents (Mayring, 2000). The analysis is used to explore the everyday life of people; reveal the structure of a particular human experience and the meaning that a person has for a particular object, situation, event or aspect of their own life. Unlike quantitative, this method is related to the more open nature of the research itself and involve formulating the problem and initial hypotheses only in a very general way and then specifying them during the research process, and require specific ways of collecting, processing and analysing data (Dierckx de Casterle et al., 2012). Thus, the mechanism contains a subjective component, therefore when
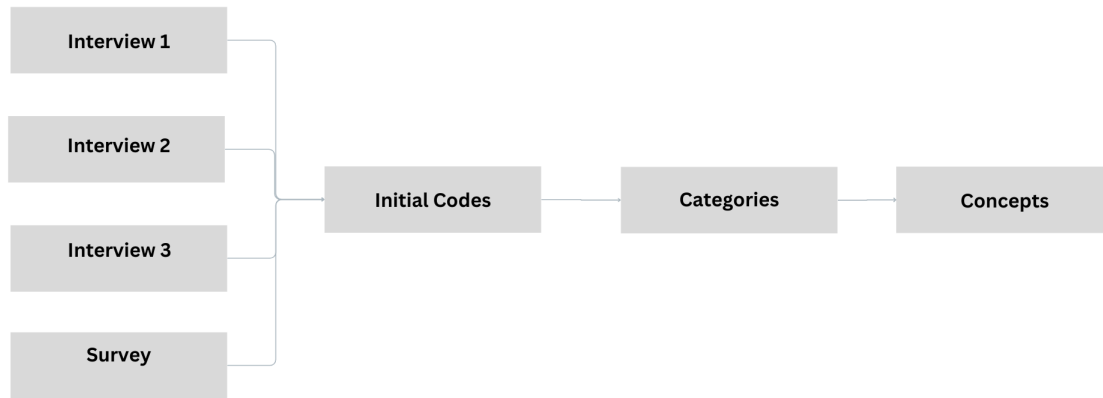
Figure 6 The Research Design of thesis depicted in the context of Grounded Theory (Strauss and Corbin, 1997)

collecting data the researcher must be sure that the respondent correctly understands the questions addressed to him or her (Kvale, 1988).

When a need arose to integrate quantitative analysis with a more specific qualitative approach, one possible tool for the implementation of qualitative methodology has been created - called a **grounded theory** (Strauss & Corbin, 1997). Although it makes use of quantitative data processing, essentially it is a qualitative approach to scientific study. This approach was developed to support the conduct of qualitative research and the subsequent processing of qualitative data. The key idea behind is theory building i.e. the model of the object under study, should not precede the examination and analysis of information about the object obtained in the research process. On the contrary, it is the empirical data obtained that allows for building an adequate or *grounded* model of the object under study or theory. To achieve this and to avoid researchers' inherent biases about the object under study, the authors of the approach recommend the use of their proposed toolkit in the analysis. Additionally, it is set that the analysis of qualitative data should be carried out in several stages.

Figure 6, therefore, shows the baseline methodology design of this dissertation applied in accordance with the grounded theory. The first stage is obtaining raw data, which entailed conducting three expert interviews and one survey - covered in more detail later in the chapter. After the data is collected, the next stage involves coding i.e. breaking down the text or transcripts and giving each occurrence, idea or even a name. As a result, the labels are combined into specific categories, attributes and dimensions which the researcher chooses accordingly (M. Williams & Moser, 2019). After going through all the procedures, the researcher obtains what is called a valid model of the object of study, that is, generated objective knowledge or concept about the subject under study. In their current development, the qualitative methods rely on IT, which serves to improve the tools and popularise the methods themselves.

According to Golafshani, 2003, in the context of qualitative data analysis, validity is particularly important since analysis usually involves the interpretation of imprecise data, obtained through various observations, interviews, focus groups and other methods. Validity implies the extent to which the information is free from theoretical errors, i.e. errors associated with incorrect underlying theoretical assumptions in the development of research methodology. Information is said to be valid if the researcher measures exactly the property of the object under study that was intended to be measured. As such, to increase the validity of qualitative research results, it is useful to apply the method of *triangulation* - the use of diverse methods in analysing the same empirical events (Heale & Forbes, 2013). The term was first applied by the American sociologist (Denzin, 2007), who borrowed it from navigation and geodesy, where the term meant the technique of constructing a third point based on previously known two points. In his book, Denzin explained how each method allows different aspects of reality to be discovered, while various methods must be used to allow these aspects to emerge. By definition, the use of triangulation in research design has several advantages that can strengthen the rigour and validity of the study, especially in complex and multifaceted topics such as the digital divide (Heale & Forbes, 2013). The field of the digital divide is a multifaceted and complex phenomenon that encompasses various dimensions, such as access, skills, and usage. By using multiple sources of data and methods, such as surveys, interviews, and case studies, triangulation helps capture the complexity and diversity of the digital divide and avoid oversimplification or reductionism. At last, it provides a cross-checking mechanism to identify inconsistencies or discrepancies and ensure that the data or methods are reliable (M. D. Moon, 2019).

One of the most important features of the methodology is the involvement of an in-depth study of a situation or event so that one takes into account mainly its internal characteristics, but also the context in which it occurs (van Thiel, 2014). According to the principles and guidelines put forward by Baskarada, 2014, a case study is a valuable method for understanding phenomena within real-life contexts. The main purpose of a case study is an attempt to understand all the variables that affect the particular situation being studied and how they interact with each other. A single-case study was chosen for this dissertation, which may help expand the existing knowledge on digital development and provide an understanding of the phenomena under study (Yin, 1994). The value of the method of single case analysis lies primarily in the fact that the researcher can make generalisations based on inductive inference, or confirm hypotheses by appealing to facts. However, there is also a certain risk, which is usually pointed out by the methodologists of experimental psychology: to draw incorrect, artificial conclusions, turning a fact in favour of the researcher's con-

cept. Thus, the research takes Azerbaijan as a single case study as it provides valuable lessons and insights in the fields of e-government and digitisation. The information provision of the study is made up of the statistical collections of the State Statistics Committee, the materials of international organisations, such as the ITU, ASD and OECD, as well as the reports of the ministries and institutions of the Republic of Azerbaijan - mainly, Ministry of Digital Development and Transportation (MDDT) and Ministry of Science and Education (MSE). The work also used published research, monographs and articles, materials of periodicals and Internet sites related to the topic of the research. The availability of existing institutional documents is perceived to be reliable data sources as they normally consist of high-quality content (Danto, 2008).

3.2 Identification and motivation of the problem

The Azerbaijani digital space is characterised by large socio-economic differences in the development of the regions, which affects the economic and institutional structure, state regional, industrial and social policy and the development of the country's economy as a whole (Valiyev et al., 2022). The Internet in Azerbaijan appeared without the intervention of the state and, having developed, became regulated by state legislation (Alexey Sidorenko & Geybullayeva, 2010). At present, it is noted that the functioning of e-government contributes to the expansion of information space, and the problem of the ratio of the state and citizens in the mechanism of functioning of the national information space is one of the most debatable and underdeveloped. Changes in the nature and content of political processes, market transformations in the economy, and socio-cultural dynamics coincide with the intensification of the digitisation process in the country (Valiyev et al., 2017). The development of digital infrastructure projects in Azerbaijan has had a positive effect on the level of e-inclusion in the country. Alas, Azerbaijan's past merits and achievements in the development of network infrastructure are not reflected in international reports and rankings today.

The motivation for this dissertation stems from the growing concern over the digital divide and its impact on access to public services, particularly in terms of the comparison of urban versus rural areas of the Republic of Azerbaijan. While the benefits of e-government services are widely recognized, the digital divide has resulted in unequal access to these services among different segments of the population. At present, the reasons for the informational differentiation of Azerbaijani regions remain poorly researched and debated, which prompted the author to write this research study. Poverty and digital illiteracy is still a common issue among people who live outside of Baku; in some cases, even inside the capital as well. This study seeks to address

this issue by examining the extent to which the digital divide impacts citizen access to public e-services in rural areas of Azerbaijan. Although ICT is widely recognized in the country and used in many public agencies, the system still needs improvement and not all households are equipped with a simple broadband connection to technology infrastructure. Using digital devices and web tools should not be a privilege for people, be it school children or older generations, and the utilisation of ICTs should be available and taught. As such, the topic of this dissertation is of high importance both for the main researcher and for everyone who resides in Azerbaijan. By identifying the factors that contribute to the digital divide in regions and their impact on e-inclusion, this study aims to inform policymakers and stakeholders on strategies to bridge the gap and improve access to public e-services in rural areas.

To achieve these goals, an exploratory methodology was employed (Reiter, 2017), consisting of the collection and analysis of qualitative data, gathered through several semi-structured interviews and a questionnaire discussed further down the chapter. The scientific novelty of this dissertation work is that a comprehensive study of the digital divide issue in Azerbaijan was carried out, and therefore, the scientific approaches to socio-economic transformations in the republic were expanded. Azerbaijan is a particularly interesting case study for examining digital divide issues, as the country has experienced significant digital growth and modernization in recent years, but still faces challenges in terms of infrastructure development and access to technology. Thus, the research question this thesis seeks to answer is:

> To what extent does the digital divide impact citizen access to public e-services in rural versus urban areas of Azerbaijan?

The main question is constructed rather more broadly to better understand all the relevant elements and impacts of the digital divide in the e-government sector. Thus, the following questions that guide this research include:

1. What is the severity of the digital divide across Azerbaijan?

2. How does the digital divide exist with(in) existing social structures in Azerbaijan?

3. What is the participation rate of rural versus urban populations in e-government?

With observations made while answering the above-mentioned questions, this research paper seeks to understand how Azerbaijan, as a post-Soviet state, is wisely using technology today for socio-economic development, with an in-depth focus on the e-government sector as a pivotal example.

3.3 Data Collection

3.3.1 Survey

Since the primary aim of this study is to assess how the general public uses online governmental services, it is necessary to evaluate public opinion in order to investigate the issue from the inside, or from the perspective of Azerbaijan (Kohut et al., 2012). The first part of data collection involved a survey - a technique of direct or indirect collection of primary data through social interaction between the researcher and the interviewee (Leeuw, 2012). The specifics of the method lie in the fact that when it is used, the source of information is a person i.e. respondent - a direct participant in the social processes and phenomena under study. In sociological research, it is nearly impossible to survey the population at large because of the areas under study (Little & McGivern, 2014). Therefore, a qualitative study is usually preceded by the construction of a sample of elements. In his overview of survey research methodology, Krosnick, 1999 identified several principles including but not limited to sampling techniques and questionnaire design. The author accordingly emphasised the need for representativeness and generalizability when conducting surveys, the essential part of which is random sampling, such that any member of the population had an equal chance of being selected for the study.

As the research question under study involves the utilisation of public services and ICTs, it was decided to include in the sample the population of Azerbaijan aged 18 and above, with possibility of access to government platforms. Since no data is available about the target population at the beginning of the survey, the most adequate sampling model is the so-called *simple random sampling.* The sociological survey used in the study, unlike other methods of collecting information, makes it possible to catch through the system of formalised questions not only the opinions of the population, but also the nuances, and shades of their attitude and thinking structure, and to reveal the role of aspects in the simplest and most accessible method of collecting primary data (Krosnick, 1999; Marshall, 1996). Indeed, its immediacy, simplicity, and cost-effectiveness make this data collection technique very demanded and a priority over other sociological research methods (Brant et al., 2015). However, one of the risks associated with questionnaires is obtaining quality data; and this requires the right conditions and the fulfilment of certain requirements. When filling out the questionnaire online, the respondent is unable to ask the interviewer for clarification of unclear wording. Therefore, the questions should be formulated as clearly and unambiguously as possible, in simple and understandable language.
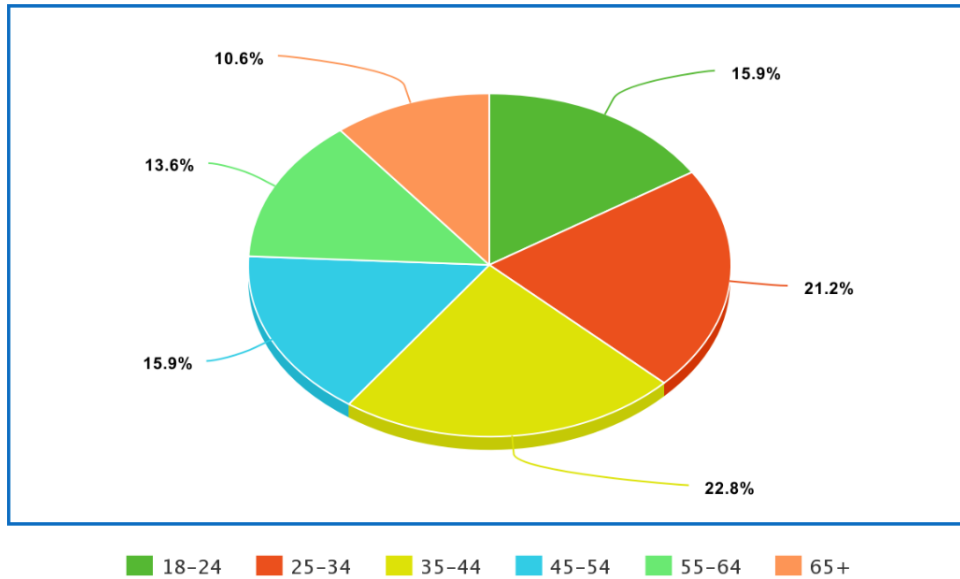
Figure 7   Distribution of Survey Respondents by Age

The survey designed for this dissertation paper focused on both rural and urban residents of the Republic, who shared their opinions on the broadband network and digital technology. According to Brant et al., 2015:

> If a researcher were to only use an Internet-delivered questionnaire, individuals without access to a computer would be excluded from participation (p. 3).

Therefore, a combined questionnaire was used to conduct the survey as this study encompassed the investigation of Internet and ICT access questions, consisting of: 1) an online survey using *Google Forms*; 2) a field survey using face-to-face interviews via the identical questionnaire on a tablet device. As such, an online version of the survey has been created and made available to participants who had direct access to the Internet. The participants were able to complete the survey on their own time and pace, using any device with a connection to the network. The face-to-face questionnaire was conducted in person by the main researcher. The respondents were chosen through various methods such as street intercepts in rural areas and via simple random sampling online (Bradley, 1999). Questionnaires followed the survey protocol, such as asking questions in a specific order, and case of face-to-face encounters, ensuring that participants understood the questions being asked. The responses by all parties have been recorded in one combined Excel sheet. Participation in the study was voluntary. All survey respondents were kept anonymous, meaning that no names were recorded. The data collected was kept confidential and was only used for the study.
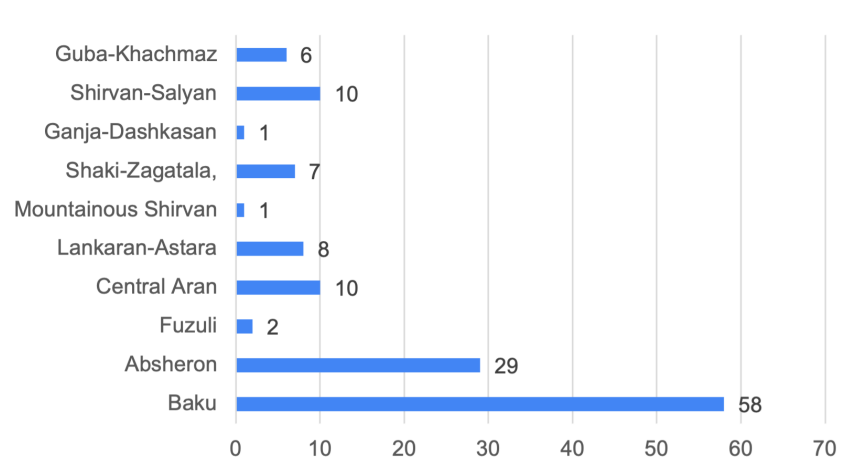
Figure 8   Distribution of Survey Respondents by Regions

The survey was conducted both online and offline, with face-to-face questionnaires being conducted with rural residents, while the digital survey was administered to urban residents. Several scholars highlight the advantageous role of the Internet in collecting surveys as it allows us to reach the target audience regardless of their place of residence, including remote regions. The survey questionnaire consisted of closed-ended questions and was designed to capture data on the aspects of the digital divide in Azerbaijan and its impact on e-government services. The questions remained identical for both urban and rural residents. The survey was conducted over four weeks, and data were collected from February to March 2023. The research sample was drawn from people over 18 years of age living in the metropolitan areas (Baku and Absheron) and the country's regions (Fuzuli, Central Aran, Lankaran-Astara, Mountainous Shirvan, Shaki-Zagatala, Ganja-Dashkasan, Shirvan-Salyan, Guba-Khachmaz).

The overall sample size for the study was 132 respondents, with 87 respondents from urban areas and 45 respondents from rural areas. Thus, the allocation of face-to-face survey collection was as follows: Shaki-Zagatala (6); Shirvan-Salyan (10 respondents); Lankaran-Astara (8). Figures 7 and 8 show the distribution of participants by age and place of residence, respectively.

As the survey collection progressed further, the respondents were equally partitioned between rural and urban areas to ensure a representative sample. Representativeness determines the extent to which it is possible to generalize the results of a study involving a particular sample to the entire general population from which it was collected (Grafström & Schelin, 2014). A prerequisite for a representative sample is an equal probability of including every element of the general population. Consequently, data was collected from both the online and offline components of the survey and then combined to create a comprehensive picture of the participants' digital skills.

Results were entered into a database and cleaned to ensure that they are accurate and complete. Any missing data or outliers were identified and handled appropriately; such as incomplete questionnaires or unidentified responses.

3.3.2 Interview

Another qualitative method for obtaining information in empirical research is the interview. An in-depth interview as a method of sociological research is a conversation between an interviewer and a respondent, which is conducted according to a certain plan or guide and involves mandatory recording on audio or video media. According to Bolderston, 2012, interviews are forms of socio-psychological communication in which the order and quality of questions, the environment where interviews are conducted, the academic preparedness of interviewers, and the psychological and emotional conditions of interviewees impact the results. It should be kept in mind that the absence of these factors can distort research objectives and the quality of academic analysis. Mathers et al., 2000 highlight that conducting an interview helps the researcher to obtain supplementary information. In general, interviews as a form of data collection, especially with experts and people directly involved in areas related to research topics, provide deeper insights and overviews about issues under study (Drever, 1995). In a qualitative interview, an important step is to establish contact with the respondent before the interview begins. This requires obtaining the respondent's consent for the interview and recording the conversation.

It should be borne in mind that the validity of an interview as a method of obtaining sociological information depends on several latent factors that can lead to distorted information (Bolderston, 2012). First, in describing certain events in their lives, the respondent may hold to socially approved evaluations, which distorts the facts, i.e. provides incorrect information. Another problem in interviews is the over-detailing of the respondent's story, which can make it difficult to identify relevant and meaningful components of the information and significantly shift the emphasis. Overcoming these characteristics of respondent behaviour in the interview process requires a high degree of skill on the part of the interviewer. Methodologically, interviews differ in the degree to which the interview instrument, i.e. the questionnaire and the interviewing procedure, is formalised. A structured interview provides options for the respondent's answers to the questions posed and does not allow for any deviations from them. This method is used when there is limited time to collect information or when it is technologically difficult to carry out an open-ended conversation. A semi-structured interview, on the other hand, allows the interviewer to better understand the essence of the issues being studied and to record an expert's interpretation based on the experiences or knowledge (Dearnley, 2005). When conducting a semi-

structured interview, a general outline should be drawn up in advance, listing the thematic blocks to be researched and highlighting the aspects for which more detailed information is to be obtained. The formulation of individual questions takes place during the interview, depending on the context. When conducting a semi-structured interview, it is important that the flow of the interview is free and that the questions of interest to the interviewer are organically integrated into the story as clarifications, without disturbing the overall flow of the conversation (Bolderston, 2012). If this is not possible, the interviewee should not be interrupted, but questions should be asked at the end of the interview.

As a result, semi-structured interviews provided rich, in-depth data on the perspectives and experiences of different experts on the topic of Azerbaijan's digitisation efforts. The interviews were conducted with three experts over three separate sessions during February and April 2023. The interviewees were chosen based on their knowledge of the main research subject i.e. digital developments in Azerbaijan. All interviews were conducted virtually and have been recorded through the app, for the sake of ensuring redundancy, and were transcribed using a partially automated online service. The interviews were conducted remotely due to the geographical distribution of participants and were recorded through audio and then transcribed for analysis. An interview guide was developed that includes a list of open-ended questions, which was used to guide the interviews. The questions were designed to elicit information about the stakeholders' knowledge, attitudes, and experiences related to the digital divide in Azerbaijan.

The first interview was conducted in English language and took place via Zoom platform at the interviewee's convenience. The interviewee was Dr Anar Valiyev, Dean of the School of Public and International Affairs, Associate Professor and Jean Monnet Chair at ADA University in Baku, Azerbaijan; hereinafter referred to as 'Interviewee 1'. The main research field of Dr Valiyev is urban development and sociology. One of the recent topics Dr Valiyev has been researching is the emergence of Smart Cities in Azerbaijan. During the interview process, digital implementations in Azerbaijan; challenges and obstacles; and prospects for closing the digital divide gap have been examined to analyse the case of Azerbaijan more profoundly (Appendix A). Dr Valiyev was allowed to address any issues that he felt were important that had not been asked directly. After all the answers were transferred to transcripts, the findings have been analysed and coded according to the answers to each question for a clear and useful conclusion. The second interview was conducted in the English language as well and took place via the Microsoft Teams platform at the interviewee's convenience. The interviewee was Mr Vusal Khanlarov, the head of the Bureau of ICT for Education as part of the Ministry of Science and Education (MSE) in Azerbaijan;

hereinafter referred to as 'Interviewee 2'. Due to the area of expertise, the questions set addressed to Mr Khanlarov were modified to adapt to his area of expertise and therefore inquire about the digital literary aspects of the problem researched (Appendix B). The third interview was conducted in the Azerbaijani language and took place via the Microsoft Teams platform at the interviewee's convenience. The interviewee was Ms Aziza Vidadi, Assistant to the Director of the e-Gov Development Center in Azerbaijan. For the past years, the interviewee has been part of the digital transformation of the Azerbaijani government and the application of electronic and digital services to the Azerbaijani environment; hereinafter referred to as 'Interviewee 3'. The questions asked were somewhat similar to the previous two sets of interviews, only with small modifications made to explore the e-government field of Azerbaijan more deeply (Appendix C).

All three interviews began with general questions about the interviewee's experiences and knowledge of electronic government in Azerbaijan, without discussing specifics related to any one service or topical area. The second part of the interviews involved a discussion on the existing digital gap in the country and its relationship to the aforementioned e-government services. Thus, all interview recordings were transferred to transcripts, one has been translated into English from Azerbaijani then the findings of those interviews have been analysed and coded accordingly for a clear and useful conclusion by the beginning of May 2023. The primary data that have been reached by the interviews were indeed considered to test the hypothesis and to come to a helpful conclusion.

3.4 Data Analysis

A few principles surrounding the analysis of qualitative data were put forward by Auerbach and Silverstein, 2003, where authors suggested the importance of an in-depth understanding of gathered data. As such, descriptive analysis is a valuable method for exploring interview data and identifying patterns and themes in the responses of participants. Previously, researchers used paper versions of interview transcripts, highlighting key fragments with coloured markers or using scissors to cut and/or paste quotations to structure small amounts of data. For the last decade, the scale of materials available and being analysed has increased and the data have become more diverse, including multi-format interviews, observations, photo and video evidence, social media messages, and so on (Bryman, 2012).

The organisation of qualitative research data is done through thematic analysis such as content analysis - a method, used to uncover the implicit content of communication by identifying patterns in text structure and is based on assessing the frequency

distribution of language units, which can be a word; a sentence; a theme; an author; or else (McTavish & Pirro, 1990). Researchers of the content analysis method have defined its stages in different ways. After careful analysis, six main stages have been identified in the preparation and conduct of content analysis.

Some scholars (Erlingsson & Brysiewicz, 2017; Mayring, 2000; M. Williams & Moser, 2019) call for approaching content analysis as a kind of methodology rather than just a technique. In contrast to a research tool, the method implies a kind of philosophy and a comprehensive approach. The essential operation in content analysis can be thought of as coding, or assigning a code to a piece of text - the tag being a sentence or paragraph. When discussing content analysis, several scholars also formulated the similarity of content analysis with pattern recognition in statistical research (Bunke & Riesen, 2011; Vaismoradi et al., 2013). In the text, as an array of qualitative data, it is required to recognize codes that allow it to describe it more concisely by the task facing the researcher. According to M. Williams and Moser, 2019, coding is a useful technique for analysing interview data because it helps to organise and categorise the data into meaningful themes and patterns. The content analysis procedure requires the selection of a set of texts according to homogeneity and thematic representative-ness criteria (Erlingsson & Brysiewicz, 2017). A list of analysis categories is then generated, taking into account the inter-category relationships, and the observation units that should be meaningful for interpretation and unambiguously identifiable in the text. Coding, i.e. recording each occurrence of an observation unit in the text, is done manually using questionnaires or using computer programs (Auerbach & Silverstein, 2003). The calculation of frequencies, relative and specific weight, probability of occurrence, etc. provides material for qualitative or quantitative conclusions. This approach involves identifying patterns and themes in the experts' responses, which helps to provide a deeper understanding of the digital divide in Azerbaijan in addition to the document reviews. According to Bolderston, 2012, the interview results either confirm or reject the hypothesis gathered by document analysis and prior literature review and in the case of rejection, point in the right direction and create new propositions.

The use of software designed to structure textual data partly eases the time-consuming task by making the analysis process more systematic, transparent, reproducible and time-consuming. The development of various Qualitative Data Analysis (QDA) software, such as MAXQDA, NVivo, QDA Miner, Qualrus, ATLAS.ti and more, have repeatedly been subjected to a comparative analysis when it comes to their functionalities (Wolski, 2018). For this study, the author used the NVivo 12 software developed by QSR International, a leading developer of qualitative data analysis software. The particular QDA allows you to classify, sort and organise information;

investigate data dependencies; and combine analysis with search and modelling. As carefully explained in the research methods book by Bryman, 2012, QDA allows you to code data in various ways, build diagrams and use various visualisation techniques. NVivo software offers advanced graphical and visualisation capabilities to reflect the information; the goal is to identify patterns and trends in the data that can help answer the research questions. In the context of the case study that utilises expert interviews, NVivo can be particularly useful in analysing and interpreting the data collected, enabling researchers to systematically identify and categorise key themes and concepts, which can then be analysed and synthesised to form a comprehensive understanding of the research topic (Alam, 2021; Edwards-Jones, 2014). A deductive or *top-down* approach (Azungah, 2018) is utilised to code survey results, interview transcripts and national ICT strategy documents. The application of a systematic approach involves the fragmented study of the properties of objects, systems or processes and as such sequencing and processing them afterwards (Zhang & Wildemuth, 2009). The result of this approach can be defined as detailed or attributive, as the analysis results in the identification of individual elements of the study object, without reference to other properties. The codes are therefore applied to the Azerbaijani case study to assess the extent to which the framework can be observed. A set of *A Priori* codes is applied to the data. The analysis of results is based on the conceptual framework, informed mainly by expert interviews and the systematic literature review on national policy documents. Accordingly, the case findings are highlighted by the following sub-topics or codes: (1) **Digital literacy**; (2) **Infrastructure**; (3) **E-government participation**; and (4) **Policy instruments**.

Different codes may correspond to different or the same piece of information. The data fragment is considered to be the context for the code, i.e. a formal description of the circumstances in which the code is entered. Coding is often criticised on the grounds of data fragmentation, as it results in a collection of quotations or fragments of text on a particular topic, but the underlying context disappears, which can distort meaning and interpretation. Further analytical work in most cases involves looking for patterns in the data - similar meaningful text fragments. To mitigate this challenge, the cross-check method was employed to discover inconsistencies arising after all required documents and transcripts were coded accordingly. Thus, the QDA processing methods and techniques can provide a clear picture of the research as well as structure the information and present it in an easy-to-understand manner.

4 Case Findings

The study sought to evaluate households' overall access to ICT infrastructure, including devices and online connectivity; as well as the use of the e-government platform in Azerbaijan, the findings of which can be perceived either as a barrier or the presence of e-government participation. The results below are ideologically driven by the main actors involved in digitisation across Azerbaijan: government officials, experts and the public. After analysing the data yielded by three interview results; as well as 132 survey respondents, it was decided to group the results in categories of the codes that were utilised in the research. The order of codes does not imply any significance of the study, as each domain is equally important. It is anticipated to identify barriers and threats to e-government adoption in Azerbaijan in terms of the digital divide based on the literature review and the data collection process.

4.1 Infrastructure

The broadband network entered the social and economic life of Azerbaijan very quickly and became an integral part of socio-economic relations, as the country was one of the first former Soviet Union states to enter the Internet community (Lmahamad, 2021). Today, the Internet provision of the country remains highly centralised via two state-owned Internet service providers (ISPs) Baktelecom and Aztelecom. Reportedly, all regional centres of the Republic are now connected to the main fibre-optic telecommunications network, while the mobile network has been expanded (Lmahamad, 2021). The mobile operators employed in the state provide modern 3G and 4G services. At present all the prerequisites for the successful implementation of digitisation have been created in Azerbaijan, which are conditioned by the creation of a specialised infrastructure (ADB, 2018). With the development of the 3G network, satellite communication operators gained the opportunity to compete with cable communication operators, who were able to provide their services in regions (Frąckiewicz, 2023). According to the president of Azerbaijan Internet Forum, Osman Gunduz (Musayev, 2022), during the past period Aztelecom operator alone has started building Gigabit Passive Optical Network (GPON), more known as ITU standards to fibre connections, and other Internet infrastructure in many districts and cities, including the latest establishment in Guba region (AzTelekom, 2022). In and around the capital Baku, other private service providers are also working in this approach. Moreover, the ministry guarantees that everyone in the country will gain access to the Internet by the end of 2024 with a minimum network speed of 25 Mbit/s (Musayev, 2022).

Accelerating the country's dynamic and democratic growth, widespread ICT adoption and transition to an information society have served as the main goals of multiple strategies adopted by Azerbaijan (Interviewee 3).

> In the field of digital transformation of Azerbaijan, the issues that are going on in particular are: the first -electronic government construction, and the second is the Internet network infrastructure, which caused these special effects. (Interviewee 2)

By 2018, Azerbaijan achieved a 21 per cent growth rate in the ICT sector and became one of the leaders among Commonwealth of Independent States (CIS) countries in Internet usage (Hajiyeva, 2021). According to the Digital 2023: Azerbaijan report (Kemp, 2023b) Republic's Internet penetration rate was at 86.0 per cent of the total population from the start of the year. The nation is also undergoing a digital transformation due to the introduction of satellite Internet (Frąckiewicz, 2023). The approach is becoming increasingly popular, as it provides a high-speed connection that is not hindered by the lack of infrastructure common in many rural areas. As a result, people living in even the most remote villages may use the Internet and take part in global digitisation. Experts (ADB, 2018; Ahmadova, 2020) note that access to high-speed Internet services is still limited in the Republic. This may be exacerbated by the fact that the country is mostly rural, and in many areas, there is no access to even basic Internet services - let alone satellite connection. According to all three interviewees, improving the reliability of communications and equalising its level across the country, as well as increasing the speed of the traffic provided - are the main tasks that must be accomplished to improve access to ICT. As stated by the MDDT official:

> We, as a country, take [digital divide] quite seriously and perform the necessary tasks. By the end of 2024, we expect to provide all households with the Internet. In this regard, infrastructure is an important part of our work. (Caliber, 2023)

Survey respondents have expressed their perspectives on this matter. The questionnaire examined the access to relevant infrastructure in both urban and rural areas of Azerbaijan and as anticipated, found that rural residents were less likely to have access to the Internet and use of electronic devices, such as smartphones and laptops, than their urban counterparts. This lack of access was found to be a key factor contributing to the lower level of e-service usage among rural residents. According to Sustainable Development Cooperation Framework (UNSDCF), the agenda for

exploiting the potential of the Internet, as in previous years, includes such aspects as infrastructure development i.e. telecommunication networks, administration of the national domain zone, creation of state Internet resources such as e-government, telemedicine, online education; regulation of e-business and e-commerce; and access control and content (UN & Government of Azerbaijan, 2020). Although the number of successful e-government initiatives is increasing, the systemic effect on citizens is not very evident. A large proportion of the population still cannot afford ISPs: 51 per cent of respondents cited financial barriers as the biggest obstacle to accessing the Internet. The Azerbaijani government has not yet developed a program to overcome the digital divide by providing affordable ISP packages. As such, some of the comments regarding the improvement of Internet access across Azerbaijan were: "*Cheaper Internet. To develop and expand the Azerbaijani language on the Internet.*" Respondent 16); "*Fast Internet and price reduction*" Respondent 15); "*It is possible to improve the infrastructure, reduce the prices of devices or ensure the free circulation of devices connected to the Internet (exemption from customs and tax payments)* (Respondent 4); "*Providers should give lower prices and fix slow Internet*" (Respondent 34); "*The government should allocate funds and reduce Internet prices.*" (Respondent 58); "*Unlimited Internet plans*" (Respondent 20) and "*Eliminating monopoly, creating fair competition opportunities for providers.*" (Respondent 2). Other obstacles for Internet access that stood out from respondent answers were: insufficient content in Azerbaijani language; low levels of security in messaging and restrictions in social media. Azerbaijan has a history of censorship and has been known to block certain websites and services (Nahmadova, 2021). Another answer read: "*...we need to remove the ban on the use of many different convenient applications and programs on our websites...the problem is the lack of progress in solving the various worldwide, convenient applications and programs that the whole world has been using for a long time.*"(Respondent 32). The respondent further commented on the topic:

> Well, as a programmer and web developer, I will tell you honestly, we have very little with the use of the Internet and access to various sites and applications. For example, the worldwide ChatGPT was allowed in Azerbaijan after only 2-3 years, good thing they have now added and it simplifies a lot of work, almost in all areas.

Several scholars (Erdenebold et al., 2020; Roberts, 2020) have identified censorship as a barrier to effective e-government practices, suggesting that it lowers the public interest and trust towards using the Internet and subsequently, services offered by the government itself. Similar thoughts were observed by Pearce and Kendzior, 2012:
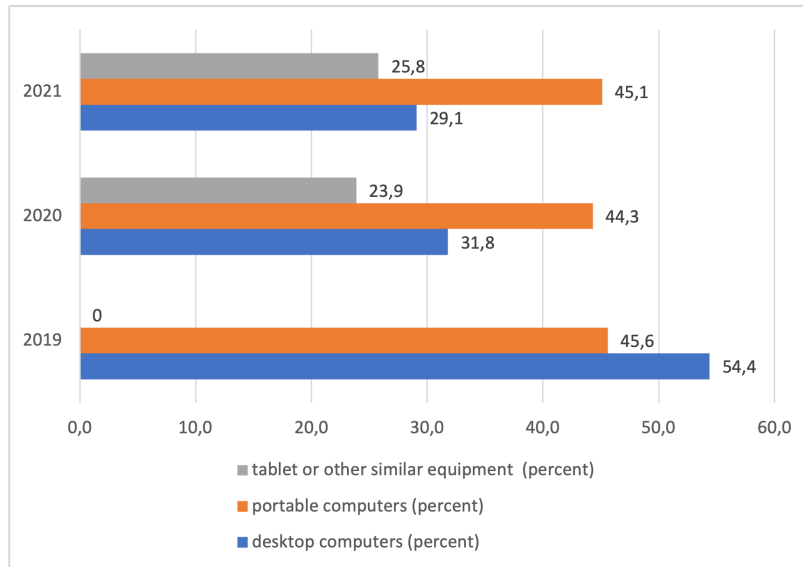
Figure 9   Availability of computers in households (ASIS, n.d.-a)

> Often neglected in analyses of the Internet, [Soviet countries] have a
> unique approach to Internet regulation that represents a "middle path"
> between open access and censorship. Their approach exploits problems of
> cynicism, insecurity, and trust particular to post-Soviet political culture.
> (p. 284)

However, no expert interviews or national sources have offered any insight regarding
the part that Azerbaijan's censorship plays in its e-participation. Therefore, the
barrier may not seem as significant as it is portrayed in literature.

In terms of the availability of ICT in Azerbaijani households, the Azerbaijan Statis-
tical Information Service (ASIS, n.d.-a) has provided encouraging results: as such,
the proportion of homes with ready access to both desktop and portable computers
has made up 72.2 per cent, whereas the presence of devices such as tablets, stood
at 25.8 per cent (Figure 9). Azerbaijan also has trouble keeping up with the global
Internet network, which is increasing in speed every year (Nahmadova, 2021). Ac-
cording to the "Internet Speed by Country" indicators, Azerbaijan ranks 124th in the
list of countries with the fastest Internet with an average speed of 35.7 Mbps. Neigh-
bouring states such as Armenia ranks 85th (73.55 Mbps) and Turkiye is 91st (64.52
Mbps). According to the survey, 76.5 per cent of respondents have experienced dif-
ficulties accessing online public service platforms. One respondent (Respondent 90)
from Central Aran highlighted that she still visits the postal office to pay for util-
ities. Another participant (Respondent 91) highlighted the frequent occurrence of
Internet connectivity problems during the exams when the website of the Ministry
[MSE] freezes and does not work. As a result, a slow Internet connection may further

Indicator	2021	2020	2019
% of enterprises with a web page	10.2	9.9	9.8
% of enterprises that have used the Internet	54.2	52.5	51.5
% of employees that have used a computer to the overall number of employees working in all operating enterprises	35.8	35.1	33.9
% of enterprises that have used computers in all operating enterprises	65.2	63.9	62.8
% of employees that have used the Internet to the overall number of employees in all operating enterprises	28.1	26.9	25.7

Figure 10   Share of enterprises utilizing ICT (ASIS, n.d.-c)

diminish the desire to utilize online tools, as interest fades as more time passes while waiting. Experts have justified the problems being related to infrastructure; necessary groundworks providing high-speed Internet are yet to be provided in Azerbaijan (Interviewee 2, 3).

Nevertheless, online connectivity is not possible unless the required infrastructure is available at hand. Literature review has demonstrated that to this day only a small portion of the population can afford to purchase a device, a modem, and pay for an ISP. Survey results in this regard were rather positive. Thus, 59.8 per cent of respondents said they used computers and/or mobile devices to access the Internet, while 37.9 per cent said they solely used the former. Meanwhile, only three out of all participants stated that they do not have access to the Internet at all - two males and one female over senior respondents, residing in rural areas of Azerbaijan. A report by Freedom on the Net (Freedom House, 2022) has confirmed that people mainly access the Internet through mobile devices only.

> Well, the Internet is one of the main resources that allow Azerbaijanis to somehow reach a bridge, somehow to close the gap of income inequality. I think access to the Internet is, I would say, should be one of the rights of the people similarly, because today people don't watch TV anymore, don't get information from newspapers. So the Internet is becoming the only resource from which they can just get information, and what can the government do to bridge the gap is just the first of all to build enough infrastructure for this type of the situation. (Interviewee 1)

Further analysis by ASIS, n.d.-c showed that just 10.2 per cent of organizations had websites in 2021, compared to 65.2 per cent of businesses that used personal computers overall. To ensure adequate interpretation of the modelling results, the overall information context of the period under study must be taken into account. A low percentage of website owners may consequently indicate a low level of digital maturity of businesses and organisations in the country and therefore lead to a lack of international competitiveness, as well as a lag in IT in general. It also further

suggests a lack of skilled IT professionals in the country, or that access to the Internet is limited. Similarly, as the literature review showed, students attending schools with sufficient computers and high-speed Internet access can, without doubt, be more inclined towards learning the necessary digital skills faster, and therefore have an advantage over states with low access to these technologies from an early age.

> Without the digital infrastructure, connectivity and devices for each citizen, we cannot talk about digitisation. Again, if we look into the Korean, Singaporean, Estonian, Finnish experiences and many more - it all starts with the infrastructure. (Interviewee 2)

The findings demonstrated that although there is a will to promote e-participation initiatives, such approaches will not include part of the population due to inaccessibility to the ICT infrastructure, starting from the Internet connectivity. Age, gender, and education might be viewed as secondary determinants whereas the location variable has been determined to be significant for access to the necessary infrastructure, including broadband connections and devices.

4.2 Digital literacy

As literature demonstrated, the increase in the number and use of digital tools, resources, and services may be explained by the literacy level as well. According to the survey results (Figure 11), an overwhelming majority of respondents (122 out of 132) have never received any lecture or exercise on the use of ICT. According to the State Standards of General Education in the Republic of Azerbaijan, the informatics or computer science class is included in the list of mandatory courses in the curriculum (E-Qanun, 2010). At the same time, these school lectures are still predominantly at the very basic level - with classes teaching the creation of simple presentations; image editing; creating documents; and working in spreadsheets (Ibrahimov et al., 2023). Much less attention is paid to the basics of programming or information security, although these are skills that are important to learn in depth. The informatics subject itself is still taught from paper textbooks, which are not always updated as quickly as they should be - even though the world of ICT is changing almost every day (Interviewee 2).

As literature review showed, COVID-19 pandemic has raised the digital divide to a new level due to the forced and massive transition of the population to distance learning and work. As such, improving digital literacy in Azerbaijan has become one of the priorities of the state's social policy. Some special educational programmes

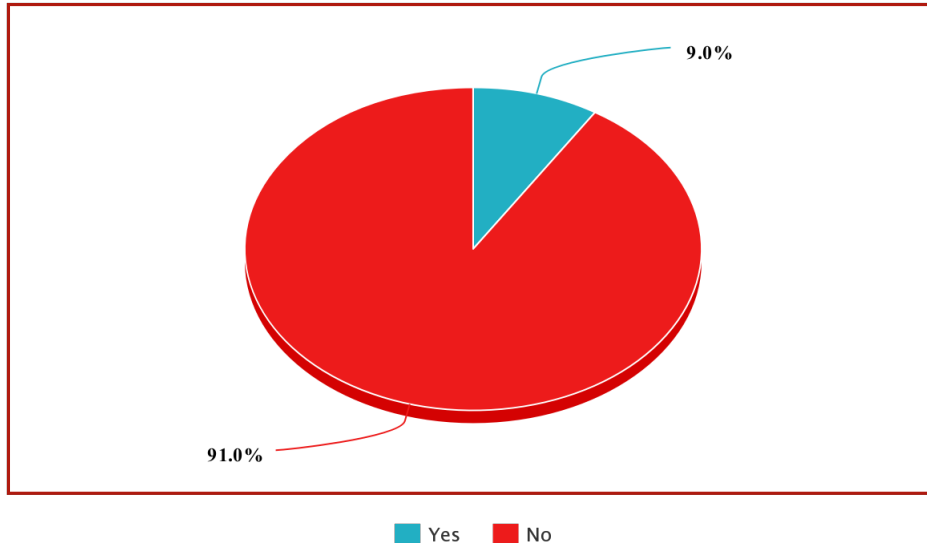Have you received any training or education on the use of ICT?

Figure 11   Distribution of Survey Responses on Digital Skills

are already in place in Azerbaijan, which have been initiated by state bodies or public organisations. In the academic year of 2017-2018, the MSE, n.d. launched the "Digital Skills" project with the help of Algorithmics. The project aimed primarily at improving the teaching of the informatics class, algorithmic and logical thinking, project-building skills and the basics of programming. According to the official website of the ministry, the scope is applied to 250 schools in the cities and regions of Baku, Sumgait, Ganja, Sheki, Shirvan, Shamakhi, Lankaran, Bilasuvar, Mingachevir, Goychay, Sabirabad, Shabran, Khachmaz, Salyan, Yevlakh and Shamkir, and covers the students of both the Azerbaijani and Russian sections. Starting in 2021, the project has expanded to additionally provide complete secondary education for children who lack parental care (MSE, n.d.). As shared during the interview (Interviewee 2), the priority project "Virtual School" created by the MSE in cooperation with Microsoft Teams (Microsoft, 2020) during the pandemic proved to be a necessary factor in the effective use of the digital educational environment in the Republic. The main objective behind the platform was to create conditions for systematic improvement of the quality and expansion of continuing education opportunities for schoolchildren through the development of the Azerbaijani digital educational space. The transition to distance learning also revealed a lack of ICT competence of teachers in the creation of online courses and the use of educational platforms. As such, MSE has launched several courses on training its instructors free of charge during the pandemic - the activity that is still on-going in several schools across the country (Interviewee 2). According to the expert, around 50,000 teachers have been provided virtual seminars on digital literacy during the coronavirus quarantine.

> During COVID 19, the virtual school platform was in the top three in the
> country. Our platform was larger than Facebook users in Azerbaijan, so
> it was quite big. After COVID-19 is down, of course we don't have that
> many users, but the good news is that around 20 percent of students and
> teachers still use the platform. (Interviewee 2)

Currently, active work is underway to expand the use of IT in schools of the republic
(Interviewee 2). The Azerbaijan Education Network (AzEduNet) is the country's
largest intranet in the field of education, uniting educational institutions of differ-
ent levels. The main features provided by the AzEduNet (https://azedunet.az) are
high-speed Internet access, filtering of malicious content, creation and organisation
of intranet communications i.e. videoconferencing, and creation of a video surveil-
lance service in educational institutions, as well as technical support for the network
and equipment. Within the framework of the project implemented by the MSE to
transform computer science classes in schools, the international programming school
Algorithmics has been helping to introduce a new way of teaching digital skills to
schoolchildren, starting from elementary grades (Aliyeva, 2021). The co-founder of
the school noted that today many countries are implementing a project to change
the methodology of teaching informatics in schools, but Azerbaijan began to do so
several years before it became a trend. The country has also hosted "The Hour of
Code" with help from the MSE, where the goal was to allow kids to compete in
the IT project creation competition, simultaneously bringing their interest into the
digitisation field (1news, 2022). Additionally, based on the plan of the MSE, every
year the government provides general educational institutions across the nation with
computer equipment. The use of computers plays a very important role in realizing
the creative potential of students (Interviewee 2). ICTs have radically changed the
technology of knowledge acquisition, the process of transforming this knowledge into
education and its application in practice.

> ...I think the biggest impact was that we started buying computers to the
> schools, because before that [COVID-19], it was very hard to get money
> from the government to buy computers for the schools. (Interviewee 2)

Literature showed that training a skilled workforce is one of the most important tasks
of the information society. It should be emphasized that educational institutions that
have joined the Azerbaijan Education Network have access to a variety of programs
that demand high traffic, video conferences, and online learning materials hosted in
MSE (Interviewee 2). Nevertheless, research also demonstrated that even though
there is a significant inequality between rural and urban schools in terms of computer

literacy skills, if provided the same equipment students' geographical features do not indicate any major divide in skill development (Interviewee 2). As such, once again, infrastructure comes to the front as the first and foremost necessity for digital literacy. Although more and more resources are allocated for this purpose in Azerbaijan every year, the shortage of highly professional ICT specialists is visible due to the initial lack of digital skills (Foundation, 2021).

When we talk about digital literacy, the rural-urban divide still exists. The inability to have a constant access and easy acquisition of digital skills for remote locations even in the modern era is a widespread issue throughout the world. To this day, majority of rural areas of the Republic lack the capabilities of ICT utilisation due to the low speed of the Internet or the absence of it - which prevents the development of electronic public services in these areas.

> ...the residents of the capital are more informed about the services provided by state institutions or private institutions, because as you move away from Baku and go to more distant places, this digital literacy decreases or sometimes does not even exist at all. Some workshops are taking place in order to increase the information knowledge, but I personally think it is still not enough and even more training is required. (Interviewee 3)

The experience of Western countries showed that the leading role in improving computer literacy first starts with proper general education. A downside of these systems overall is that it is rather rigidly bound by the curriculum (Schneckenberg, 2009). Even though small adjustments have provided major developments for the country's digital intelligence level, the MSE has not adapted the curriculum in a long time (Interviewee 2).

4.3 E-government participation

As underlined by many researchers, the idea of digital development requires not only policies, government tools, and infrastructure, but also the active participation of the citizens and residents in all stages of the decision-making process (UN, 2022; UNDP, 2022). The fluctuations of digital development in rural areas of Azerbaijan are determined not only by infrastructural difficulties but also by lower demand due to the way of life (Interviewee 3). Because of this, and additionally due to a lower standard of living, rural dwellers budget for Internet costs as an additional, non-binding item. They are less likely than urban habitats to turn to the Internet as

a source of information, financial transactions, or purchase of goods and services. Nevertheless, a lag in digital literacy development is an additional issue, and even though the proportion of rural residents who are digitally connected is increasing, the gap with the Absheron peninsula is still significant. Nevertheless, the survey revealed that even with similar levels of access to technology and digital skills, the effectiveness of ICT use, as well as the social benefits that users gain from this use, can vary markedly. The conducted research by Ragnedda, 2018 revealed similar trends, attributing them to the poor development of the information infrastructure, the lack of technical connectivity to the network or the poorer development of services in rural areas. Since similar conclusions were observed in other works, the hypothesis of the influence of the place of residence factor was selected for testing as well. Leaving the urban-rural divide aside, the gap exists even between the cities of Azerbaijan (Interviewee 1). Survey respondents have also shed a light on the issues they have experienced at one point or another while accessing e-government platforms: 103 (or 78 per cent) participants out of the overall 132 have reportedly encountered difficulties with e-services offered by the public authorities. Some of the additional comments from participants were: "*I rarely log in through the Internet. However, we visit ASAN in a nearby city for paperwork when needed.*" (Respondent 68); "*We visit the postal office to pay for utilities.*" (Respondent 90); "*It doesn't work*" (Respondent 89); "*I generally don't use [online services].*" (Respondent 117).

Residents who oppose e-government do not accept what the government says about the benefits of electronic services over traditional services and would rather avoid risky situations than engage in even the most basic of interactions, such as meeting in person to inquire rather than visiting a website. Trust is an important element in building the information society (Interviewee 2), but the increasing spread and use of technology have been accompanied by negative factors and concerns related to the insecurity of certain data transmission channels, cyber attacks, state pressure on civilian structures, and uncertainty about the rules and norms of the new type of communication. In traditional models, a typical model of interaction between a citizen and an official is based on a combination of high values of power, since an individual can one way or another contribute to the way the service is being delivered whereas in electronic models it is nearly impossible. Therefore, in some circumstances, the significant relevance of the potential for direct contact with public officials may be emphasized. Citizens use a variety of tactics that generate informal reactions to services and are therefore focused on *manipulating* the public servant. The transition to electronic services, which presuppose the anonymity of the interaction, requires a restructuring of this habitual model (Interviewee 1, 2, 3). It is about the abandon-
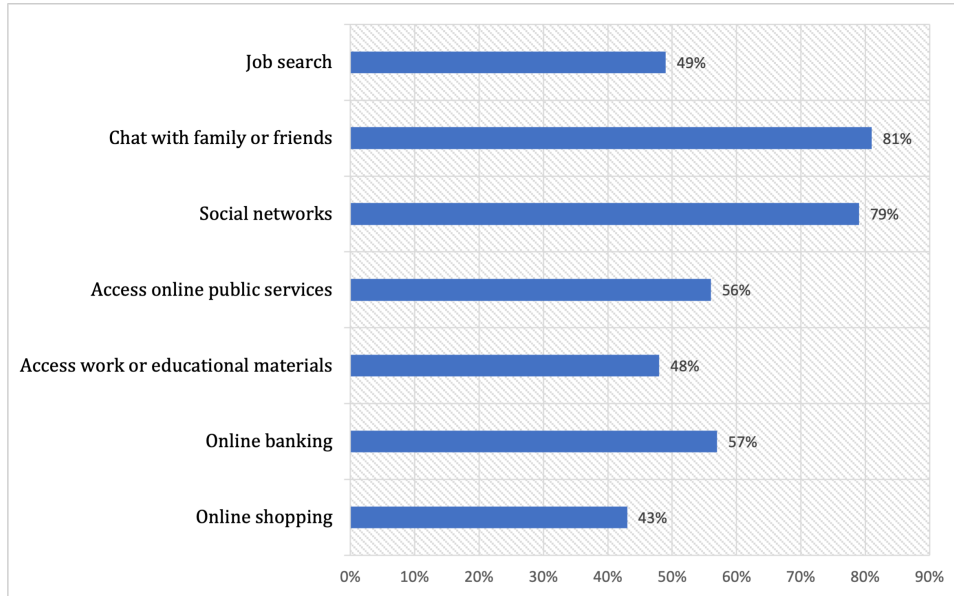
Figure 12   Survey Responses on Internet Usage Activities

ment of established forms of tactical control over the behaviour of representatives of the authorities.

As survey results showed the majority of Azerbaijanis are active Internet users: they use the Internet every day (81.8 per cent) or several times a week (14.4 per cent). Surprisingly, several respondents (3.8 per cent) have also confessed to using the network once a week or not at all - these participants were all identified as aged 65 and above. This data allows us to talk about the potential readiness of citizens to use ICT and provides an opportunity to assess whether this is related to the level of trust. A survey by E-Gov Development Center, 2020 for assessing the current situation regarding digital literacy was additionally assessed for the comparison with the study results - as a result, out of 1171 respondents only 386 (33 per cent) confirmed using public services online in rural regions of Ganja, Masalli and Guba districts. It is also worth noting that the participants were distinct in their educational backgrounds, varying from no education (1 per cent), higher education (27 per cent) and only secondary education or college (72 per cent). Intriguingly, only 10 per cent of the study respondents were female. According to the E-Gov Development Center, this is because, in the regions of Azerbaijan, it is typically the opposite gender who handles paperwork; as a result, the majority of women either did not have the opportunity to participate in the survey or simply did not have the experience to contribute.

Despite the active use of the Internet, respondents' preferences regarding channels of communication were not so clear-cut. According to Figure 12, accessing public e-services held only the fourth place (56 per cent) among the respondents, after chatting with family or friends (81 per cent), Social Networks (79 per cent) and

Online banking (57 per cent). Despite the collected survey results, various government officials indicate an increase in rates of e-government satisfaction among residents (Interviewee 2, 3). In light of the findings, factors like age and educational level may assist in clarifying why e-participation may be less prevalent than other more common activities among Internet users, such as Social Media and Networks.

> Whether during the pandemic period or after, there is a significant increase in the use of electronic services by citizens. Either it shows itself in the comments received on the posts of government agencies that promote government services on social networks, or in the questions received by the health care centers. It also showed that citizens prefer to use electronic platforms in their daily basis due to working times or locations. (Interviewee 3)

Overall, the main difference between *active* and *temporary* supporters of e-government was not so much in the frequency with which they accessed e-services, but rather in their ability to use the services offered: active supporters of e-government had a wider range of modes of interaction. This was also true for the e-services themselves and the information resources on which they are available. The reasons for the success of active supporters at the tactical level become clear when their socio-demographic characteristics are analysed. As such, this is a classic portrait of the information-rich - the middle class who are adept at exploiting the opportunities of mass dissemination of ICT. Consequently, the opponents of electronic interaction with the state are above all older generations.

> ... there is a certain age group that would benefit from [digital literacy trainings], because they should understand that it would be more effective for them to use the services by just connecting to the Internet without leaving the house, making use of their limited time and resources. Our biggest obstacle is the digital divide. A lot of great work is being done in this direction in the country, either in the private sector or in government institutions, but I still think that it can be improved in a more effective way. (Interviewee 3)

These are what are commonly referred to as the information poor on the other side of the digital divide. It is safe to say that respondents from the older generation note pronounced attitudes toward the use of innovations and a rather critical attitude toward online content. Elderly respondents point to the absence of the content in available language, most likely being either Azerbaijani or Russian - the two most

spoken languages in the country; the younger generation is more inclined towards using the languages at hand on certain platforms, and to ensure the security of their online presence.

The results of the study show that the high level of Internet penetration among city residents is an important prerequisite for establishing public trust in new technologies. The above average level of utilization of Internet services for Online Banking additionally demonstrates the growing use of ICT in everyday practice. Low interest in the use of government platforms for online public services may be due to both low awareness of citizens about their capabilities, as well as existing expectations of the risks associated with their implementation (Interviewee 2, 3). According to the literature review, the socio-economic factors such as age, residence and education level, were perceived as significant factors for the use of e-government activities. Thus, findings showed that respondents with *higher education* levels were more likely to use the Internet for e-government activities. However, this indicator was not a significant determinant for ICT usage or access to digital services – rather, merely an influencing factor for the technology adoption rates. Age factors, on the other hand, have been useful in attempting to understand the digital divide among residents.

Majority of the surveyed residents described themselves as sufficiently experienced ICT users who can easily cope with a standard set of new programs for personal needs and work or education duties (Social Networks, Online Banking and so on.). Additionally, this group of respondents reported certain challenges using online public services, which points to a lack of infrastructure rather than a low degree of digital literacy. The portion of respondents who do not use the Internet and have an urgent need to improve their skills in this area are mostly in the age groups over 65 - which may indicate either low interest or low levels of awareness towards e-participation among older population.

4.4 Policy coordinations

While noting the difficulties in the transition to electronic interaction for people outside of the Absheron zone, it is equally important to analyse existing policy implementation for solving the digital divide in the country. In 2003, the former president of Azerbaijan Heydar Aliyev presented the "National Strategy for Information and Communication Technologies for the Development of the Azerbaijan Republic (2003-2012)" (E-Qanun, 2003). The framework served as a foundation for the nation's digitisation path (Interviewee 3). A year later, by the Decree of the President Ilham Aliyev (E-Qanun, 2004), the Ministry of Communications was abolished against the background of the dynamic development of high technologies in the country, and

the Ministry of Communications and Information Technologies (now MDDT) was established on its basis. As a result, the development and comprehensive application of ICT to form a new state based on information and technologies has become the main direction of the digitisation policy of Azerbaijan. Since then, numerous national frameworks have been created, including various measures aimed at promoting and developing the basic principles of open government (Tan, 2013). The main areas related to the expansion of e-government, especially in the use of ICT for public services, increased transparency in the extractive industries, increased public participation in the activities of public authorities, etc. Meanwhile, UNSDCF (UN & Government of Azerbaijan, 2020) explicitly highlights the broadband application of ICT in state and local self-government organisations and the extensive development of electronic services being one of the main directions for sustainable state policies of the Republic. The document considers e-government as a system of state and local authorities that apply ICT to transform internal and external communications to optimise the processes of implementing their functions and exercising their powers. The achievement of the priorities defined in the various National Strategies and the goals defined in the international projects have formed the basis for all subsequent development of the information and communication sector. In the course of implementing the National Strategy, the work on informatisation of the public administration was of great importance - one of the most interesting examples in the plan was the work carried out in tax administration. One of the first steps were set up by the Ministry of Taxes in 2006 - which systematically expanded the scope of e-services provided to taxpayers (Interviewee 3). As such, the Automated Tax Information System was set up and in 2007, the Internet Tax Office (www.e-taxes.gov.az) was formed.

> The efforts of digitisation impacted the life of businesses and society in Azerbaijan, especially taking into consideration the electronification of many services... for example, the recently established e-Notariat system allows us to give a certain type of documents online. You don't need to go physically to another space, you can do it online; paying taxes, doing a certain types of the courses, sending payments and so on. I think it's positively impacted the lives of people. (Interviewee 1)

As a result, the one-stop-shop principle applied since early 2000s plays a significant role in ensuring transparency in state registration, creating a more favourable environment for the continued rapid development of Azerbaijan's economy (Interviewee 3). The paradigm anticipates the centralisation of information and full synchronisation of the registration process in all administrative bodies, including the tax authorities. One of the most important developments in the country was the implementation of

the ASAN Service project (Interviewee 3). The service centres have been established following Presidential Decree No. 685 (E-Qanun, 2012) under the State Agency for Citizen Service and Social Innovation. Launched in the same year, the first ASAN Service centre had already managed to receive a fair amount of positive feedback (Zeynalov, 2021).

> Although the "ASAN Service" itself was not a service provider, it was en-
> gaged in providing its services to volunteers of several government agencies
> in one place. (Interviewee 3)

The service is based on the principles of comfort, efficiency, transparency and responsibility (Zeynalov, 2021). Based on these indicators, the centres provide citizens with prompt and transparent services, maximising the convenience of citizens using these amenities i.e. online queuing, and electronic signature (Interviewee 3). The next nation-wide innovation introduced by ASAN Service in 2013 was ASAN Imza i.e. mobile signature, which is used for authentication and digital signing of documents when using electronic services (https://asanimza.az/en/). The signature is intended for use both in Azerbaijan and abroad as it strengthens the national security system in the fight against cybercrime (Asgarova, 2021). Earlier in April 2023, the president attended the inauguration of the country's 25th ASAN Service Centre - this time in the remote village of Salyan (Interviewee 3). As local news outlet reports (Press Service of the President, 2023), in total, more than 360 services will be provided by various state bodies, as well as private companies and enterprises. As such, experts similarly pointed out that the recent activities show the digital transformations of the state happening outside the capital city of Baku (Interviewee 2, 3).

In 2018, Azerbaijan became one of the first countries to adopt The X-Road platform, integrated by B.EST Solutions, ASAN Imza and MDDT (Solutions, 2018). X-Road is a decentralized system in which common interfaces and protocols for interaction and data exchange are defined (Paide et al., 2018). Any government agency can connect its information system to the platform according to certain rules and configure access rights to it for other agencies. Thus, the collaboration between MDDT and X-Road platform is considered to have played a major role in the growth and introduction of e-government in Azerbaijan, and is one of the main initiators of innovations and development of the most advanced technologies in the country. As such, the close cooperation with Estonia, a recognized world leader in the development of innovative technologies, continues successfully.

The President of the Republic of Azerbaijan issued an order in March 2020, several days after COVID-19 was declared a global pandemic, outlining a number of measures

to lessen the negative effects of the pandemic. While the coronavirus has had a huge impact on people's lives and livelihoods in Azerbaijan, many public and private companies have shown remarkable resilience, particularly those focused on digitisation, technology and innovation (Interviewee 1). All results indicated that Azerbaijan was also one of the countries that experienced a fast pace of digitisation during and after the pandemic (Interviewee 1, 2, 3). The quarantine regime stimulated digitisation and online commerce; demand in some areas (food delivery, sanitary products and medicines) increased several times, while demand in the area of physical visits to various facilities or trips decreased significantly. The main means of payment for online purchases have become credit cards and electronic bank transfers, smart cards and digital money. Within a short period of time, the MSE required all teachers and students to join online education (Interviewee 2). A mobile application was aditionally created with the help of ASAN Service, for residents to track their vaccination certificates and interact with autorities in case of emergency (Interviewee 3). All in all, the fact that people began using ICT considerably more regularly in their daily lives also helped them become much more Internet savvy, a practice that has persisted among public even after the quarantine was over (Interviewee 1).

> ...there were positive results from using the ASAN login system and the *mygov.az* portal, and it can be seen in the statistics that citizens already felt that the transition to a digital government is a kind of COVID -19 situation - with government support, they feel more involved.

Nevertheless, COVID-19 was not the only major change that has shaken the Republic - due to the 44-day war carried out in the Fall of 2020 by the Armed Forces of the Republic of Azerbaijan, the country witnessed growing rates of urbanisation as a result of territorial restorations (Valiyev & Valehli, 2022). In consequence, the President adopted a decree on the development of the Smart City and Smart Village concepts aiming at the effective use and management of available resources for sustainable development in urban and rural areas (E-Qanun, 2021). The main motive behind the ideas of Smart City and Smart Village is that technology acts as an accelerator for growth and sustainable development. It is also anticipated to facilitate education, improve local business opportunities and promote e-government services in regions outside of Baku. Installation of these communication technologies in territories freed from occupation is one of the most important goals facing the country right now. Among the issues that need to be solved for villages, the most important are services, electricity, road network, education and basic ICT. In Baku and several other cities, particular Smart City components are being formed in the areas of public transport, communications, urban management systems, security, etc. (Frappi, 2021).

Since the end of the war, the project has been identified as the basic principle for the revitalisation of liberated lands. By the presidential order, the first State Program "Great Return to the Liberated Territories of Azerbaijan" (E-Qanun, 2022) was approved - the most important direction of which is the implementation of the Smart City, Smart Village and Green Energy zone concepts in the Karabakh region. The five-year State Program includes the introduction of smart elements in communal and other infrastructure of reviving settlements of the region, steps are planned for the application of IT technologies in the field of energy efficiency, i.e. the heating of buildings and street and road lighting. The strategy document additionally outlines measures for establishing renewable energy generating capacities and their integration into the overall energy grid, construction of charging stations for electric vehicles, etc. Of significant interest is the paper on Smart City development in Azerbaijan (Valiyev et al., 2022), where the authors describe the practical results linking the actions taken in the digitisation sector and their consequences. The paper notes that several problems have been successfully solved, but not all of the hopes for e-government have been fulfilled. More precisely:

> Azerbaijan's highly centralized system of governance prevents or discourages involvement of the public and representatives of civil society, making it nearly impossible for them to impact decision-making process. (p. 4)

Similar ideas were also expressed in this regard during the interview process:

> ...coordination is crucial. When I say coordination, it's not the centralization, but really the coordination of measures so that all services are developed for the citizens and not for the ministry...it has to be for the citizens to make their lives easier, not to make our jobs easier. (Interviewee 2)

These findings enable us to assess the prospects for the growth of e-government in Azerbaijan. The above-discussed policies and strategies imply that the success of global initiatives to reduce the digital divide and provide residents continuous access to public e-services depends on the cooperation of governmental organizations, international organizations, and other stakeholders.

5 Digital Divide in Azerbaijan: Influencing Factors and Consequences for E-Participation

5.1 Discussion of Case Findings

After the collapse of the Soviet Union in 1991, Azerbaijan faced certain progress from nearly zero Internet penetration and telecommunications infrastructure in the country to quite substantial levels of digital awareness. The development of the Internet and digital media marked a new stage of the socio-political and cultural life of the Republic. Despite the accession and rapid growth of several post-Soviet countries, which has deepened the digital divide between them and other states, literature review demonstrated that the gap can be attributed to the implementation of framework principles and approaches that support digitisation by new EU members, i. e. the Baltic States. These principles have enabled international organisations to distinguish them from states that do not meet the requirements for e-environments. Essentially, the criteria for classifying post-socialist countries became dependent on national policy factors. The fairly high pace of development of the information society in Azerbaijan has been demonstrated to a large extent by the emergence of new products and services such as cellular communications, and computer equipment; against the background of the slow level of ICT development.

The state of telecommunications infrastructure and communication services development is one of the most significant indicators of digital inequality. Most nations have transformed their telecommunications industries from highly regulated states with a single state monopoly operator to liberalized markets with a variety of high-quality services. The modern infrastructure of Azerbaijan's communication field began to form decades ago - before, the level of communication and the provision of services in the Republic was significantly lower, the foundation of the field was poorly developed, and the level of automation of production processes was noticeably subdued. The background analysis of various post-Soviet states showed that the situation was typical for the infrastructure areas of these countries - some reasons involved the insufficient amount of funds spent on the development of the communication field; low level of capital investments in the field; and inadequate appreciation of the role of communication in the national economy complex and other areas of society. International studies, as well as the experience of economically developed countries, demonstrate that high economic development is significantly influenced by the development of ICT at a proactive pace. One of the necessary conditions for the transition from the raw material model of economic development to the innovative model is the

accessibility of ICT and services to all citizens of the country. This requires the development of a national communications infrastructure.

Great growth in the first half of the 21st century was achieved in the ICT sector; the dynamic development of the field is recognized by many disciplines. In the process of formation of information society in the Republic of Azerbaijan, the electronic government institute played an important role. The e-Gov portal is at the centre of the digital mechanism as a single platform of electronic services, providing citizens, entrepreneurs, and non-residents with the services of all state structures in a single space. According to the Minister of MDDT (AzerNews, 2022), Azerbaijan is already turning into an ICT hub of the region. At present, the state pays great attention to the coverage of the territory with the e-government infrastructure. Significant focus is directed towards the development of information systems, ensuring cybersecurity, implementing electronic government, electronic signature, electronic document circulation, financial services, and undoubtedly increasing the level of Internet usage. Bearing in mind the international experience of recent years, the transition to the digital state in Azerbaijan and its formation, the organisation of electronic government and the development of intellectual potential, the ICT field, which is already considered a priority after the oil sector, is developing more dynamically. Literature demonstrated how the importance of ICT will increase in the modern era and the future. In general, the field plays an important role in the direction of the comprehensive development of Azerbaijan, raising the intelligence of the population, as well as more active involvement in the integration processes taking place in the world.

Important work has been done to accelerate the development of ICT, improve the regulatory and legal framework in this field and adapt it to the international agreements that the country is a party to, further liberalise the market of telecommunications and postal services, and develop the private sector; and these processes are ongoing. The stage of equipping public authorities with ICT has been completed and appropriate infrastructure to support their activities has been established. In general, the availability of ICTs at the national level has increased. The ASAN Service is now known worldwide as the digital brand of Azerbaijan and is highly valued even outside of its territory. The emergence of this innovative centre was a revolution, a turning point in public services, where over 300 services are now being provided. There are numerous opportunities at the moment in the country for both personnel and a strong scientific base in the field of IT. The study revealed that work in this field is carried out relatively fragmented - the government operates separately, while the private sector also independently pursues its own goals. The experience of successful countries have demonstrated that works towards digital transformation can and should be a

joint force solution - by combining forces of both the public and private sector, as well as NGOs and international organisations.

As global practices in bridging the global digital divide demonstrated, the effectiveness and efficiency of policy efforts and measures can be achieved through close cooperation and unifying the efforts of all stakeholders, including the government and international organizations. The implementation of various ICT strategies has revealed serious challenges in bridging the inter- and intra-country digital divide, primarily due to a lack of sustained investment in ICT infrastructure and services, and the necessary capacity for long-term technology transfer and knowledge. The mechanism for the formation of the national information space combines market processes and state regulation - although ICT in Azerbaijan began to develop before the state started to regulate it by legal norms. Governmental e-readiness is as significant as citizen technology adoption and consists of essential elements of perceived organisational preparedness in facilitating the implementation and subsequent institutionalisation of e-government. The adoption indicators can be described as factors that motivate or impede the implementation of digitisation.

Beyond question, the digital divide became very visible during the COVID-19 pandemic and various programs were in place in Azerbaijan to reduce it as much as possible. With restrictions on interaction in physical space, most communications in a time of challenging epidemiological conditions have moved into virtual space. The issue of poverty became even more urgent as well: the decline in production rates, the incomes of the population, and the increase in unemployment. While the epidemic was a blow to the economies of many countries, COVID-19 served as an impetus for development in the ICT field. The crisis has already spurred innovation in many new and traditional sectors such as healthcare, education, tourism and retail. Faced with unprecedented challenges from the application of educational and workplace lockdowns, increased sanitary measures and restrictions on international tourism, Azerbaijan needed to combine efforts and resources to ensure continued funding for innovations. In this context, digital transformation as a way to avoid total economic collapse has accelerated dramatically. Observations demonstrated that during the quarantine restrictions, Azerbaijanis have increased their demand for online education, an area that was previously almost untouched in the country. Despite the existence of digital technologies enabling remote education or work before the pandemic, companies were slow-moving in implementing them in their daily operations; the pandemic compelled them to accelerate their adoption. It also affected the work of government agencies - the spontaneous emergence of the pandemic and its accompanying challenges and constraints forced state authorities to switch to a remote mode of work in an accelerated manner to ensure the continuity of public ad-

ministration and service delivery to citizens, which in practice showed the readiness
of authorities in the Republic for digital transformation and interaction with citizens
(Guseynov et al., 2021).

Given the emergent necessity for electronic communication between the government
and citizens, a set of tasks to study the degree of digitisation of state structures,
identify successful practices and sort out options to improve the existing mecha-
nisms seemed relevant and significant. The auxiliary units that support the function-
ing of public institutions were mostly focused on keeping these institutions running
smoothly in the country. Although many business processes in the public sector have
been shifted to a remote format of work, thereby increasing the demand for electronic
services, the study did not show the extent to which the service delivery has improved
in terms of efficiency; and whether the public, as customers, was satisfied with the
online alternatives. It has additionally been observed that government agencies are
digitising public services as they are, without undergoing any process re-engineering
- which makes it challenging to implement a "one-stop" shop policy. The same steps
that are required for traditional service points remain unchanged in analogue formats.
One of the existing issues in the development of the information society in Azerbaijan
continues to be that the technical and economic aspects of informatisation are com-
ing to the fore, while the institutional problems are being solved more slowly. The
analysis shows that the process of building an information society in Azerbaijan is
not uniform, primarily due to the country's distinct economic and public administra-
tion development, specific political structure, social sphere, and ethical and cultural
aspects of social relations.

Azerbaijan is a country that managed to become one of the leading countries of the
CIS under market economy conditions and with the collapse of the USSR, its geopo-
litical role increased. As of 2022, the country had a total of 4,246 rural settlements
and 341 urban areas (ASIS, n.d.-b). The significance of villages in Azerbaijan is ex-
tremely high - as urbanisation in the Republic intensifies, there are significant shifts
in the differences between urban and rural areas, and at the same time problems re-
lated to the varying social development of the two habitats. In democratic societies,
the active participation of every individual is required in solving societal challenges.
E-governance, therefore, aims to restore democracy by enhancing citizen engagement
all around the country and amplifying their voices, while enabling informed deci-
sions in solving these obstacles. Increasing the degree of participation of all voters in
the country's governance processes ensures the support and expansion of self-service
opportunities for the public. Despite acknowledging all progress made in the last
decades in the Republic, the digital divide between distant regions remains an acute
problem. As a result of the research, the analysis of findings identifies three levels

of the digital divide that may be applied to the Rural-Urban inequality of the Republic. The **first** level gap is determined by inequality in access to digital networks, the Internet, which is gradually decreasing, and the growing gap of the **second** level - inequality in digital competencies, knowledge and skills of users, and proper ways of using technology. The **third** layer is applied as a result of the emergence of the previous two - the differences in the final results of the use of digital technology in the application of those competencies possessed by users.

The level of digitisation differs throughout provinces - as the survey showed, there is not one identified gap among regions outside of the Absheron peninsula. The growing digital divide leads to the fact that residents of the most developed cities - mainly the capital city of Baku, have access to a full range of digital services, but not all outskirts of the country have this opportunity, which harms their e-participation level and overall digital awareness. One of the threats of digitisation - the decline of confidence in digital technology - is also fully reflected in Azerbaijan. Literature analysis additionally pointed out that it is digital inequality that generates such a phenomenon as cyber scepticism. Among the identified causes for the digital gap between cities is the high monetary threshold of access to ICTs for both the state and citizens and the income differentiation of the rich and the poor within the country. The digital infrastructure is the basic foundation of the digital divide, on which the subsequent gaps emerge as well. It is also suggested that the cost of ISPs is an important indicator related to the digital divide and therefore has a strong influence on the individual's use of online services. It is hardly surprising that for many people in developing countries, like Azerbaijan, Internet access remains unaffordable. After several years of steady decline, the share of revenue allocated to telecommunications and Internet services has increased worldwide in 2021, largely due to the global economic downturn caused by COVID-19. Thus, the digital divide can be seen as a type of economic inequality, as a social stratification arising from unequal opportunities to access and use ICT. The differentiation of incomes of citizens accordingly provides different access to education, including mastery of technologies. Lack of Internet penetration is a major manifestation of the digital divide in society. High prices for ISPs hinder access to the Internet and reinforce the gap.

From a theoretical perspective, the UTAUT model offers the development of a decision-making element within this approach for understanding e-government adoption, and is also a well-defined way of explaining information system adoption. The results (Figure 13), obtained in a different cultural environment, require verification to be transferred to Azerbaijani realities, collected during the research. In the six-factor model applied to the case study, the development of attitudes towards e-government is indicated to be based on infrastructure, literacy, trust, shared norms and social
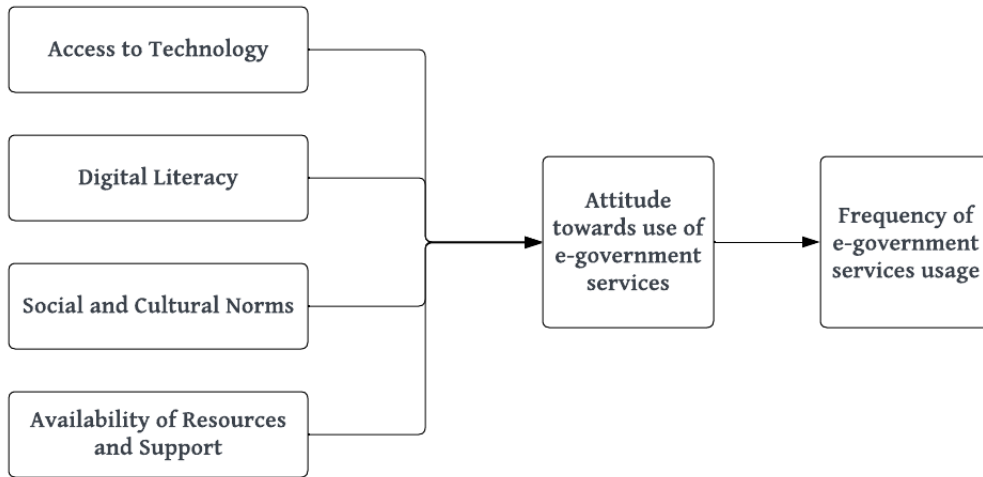
Figure 13   UTAUT applied to Digital Divide in Azerbaijan

ties. In line with the chosen approach, it was hypothesised that in the process of
new technologies taking root, unintended social effects emerge. In this study, trust
in information technology is understood as a set of perceptions, attitudes and ex-
pectations of users, as well as a manifestation of their willingness to "*delegate some
of their functions*". The Social Norms factor can be explained by the influence of
family or friends. The findings of this research are based on the assumption that
the research of different age groups is of particular importance when considering the
average age at which individuals go about utilizing digital devices in daily life. As
such, it is necessary to reveal the factors that influence preferences and the pecu-
liarities of interaction among these user groups with the technologies of interest in
terms of the development of cognitive and flexible skills necessary to substantiate
recommendations for interacting with, organizing individual and group training, and
addressing online risks. If we consider a group of residents from the same region and
with the same background and similar technical equipment, we immediately remove
several relevant factors such as age, voluntariness, expected usefulness, social influ-
ence, and applicability of the technology, that might predict variation in the success
of this group in using the e-government platforms. The remaining determinants of
the actual activity to use technology (Expected Effort and Experience) appear to be
directly related to the observed activity. To put it simply, if the respondent assessed
her experience as sufficient to make an effort and utilise the e-platform, she is likely to
have already done so. At the same time, if the individual already had an experience
of doing it independently, then the estimated expected effort was quite low. In this
case, citizens do not trust impersonal structures, are afraid of losing complete control
over the situation, and as a consequence, avoid using e-services.

Contrary to the initial prediction neither geography nor ICT experience were significant predictors of e-government use. The difference in e-participation rates is set to be explained by the reasons for which the technology is used i.e. government services, business, study, entertainment or any other. As the results of this study showed, even with similar or identical access to ICT, the means of use vary very individually. Although geography was not a main actor in the digital divide, it plays an important role - the unawareness of rural residents about the opportunities that government platforms offer to initiate the digital gap between different parts of the country. As a result, the more the public is sceptical towards the new technology, the more the impact level of the "Social and Cultural Norms" (Figure 13) on the Actual Usage. Therefore, due to the unequal access to ICTs, people have unequal opportunities to receive public and social services and develop their intellectual potential and labour competencies. This reduces entrepreneurial activity and the quality of life in regions where there is a lower level of digital development.

The digital divide can be observed in Azerbaijan both at the regional level and at the level of individual social groups; the creation of favourable conditions in the country for the transition to an information society is one of the political goals of the state. Taking these peculiarities into account is important for understanding the dynamics and main directions of development of the digital society and the prospects for regional digital integration. The challenge of transformation, therefore, lies not only in financing and building the digital infrastructure that enables Internet access, but also in the need to create effective open digital platforms for the region, re-engineer existing processes for public service delivery, create a self-provision environment, and develop and implement educational initiatives that enable the transition to the digitisation. The dominant paradigm for building an e-government system in Azerbaijan is a simple automation of existing bureaucratic procedures without revising the fundamental principles of organizing the state apparatus and transforming the content of management processes. The mass installation of gadgets, the purchase of software, and connection to the Internet does not help to improve the state's performance as a whole if appropriate regulations are not in place.

The aforementioned comparison implies that, while Azerbaijan must promote digitisation, the pursuit of digital technologies should not be addressed at the expense of the welfare of the population and the exacerbation of social disparities. This highlights the importance of adopting a balanced approach that takes into account the needs of both society and technological advancement. The absence of a comprehensive analysis of the socio-cultural prerequisites for the implementation of digitisation programs in Azerbaijan's regions can lead to systemic failures, caused primarily by misunderstanding the real situation and formal links between the three levels of government:

central, regional and municipal. This aligns with the theory of SST (R. Williams &
Edge, 1996) about the trajectories of institutional development and the role of public
support for modernization projects, where authors suggest that technology is shaped
by social forces and values and that the design and implementation of technology
should take into account the social context and impact. The modernisation of the
Republic's governance system has highlighted the need to build modern management
models different from traditional ones, ensuring transparency in the activities of state
designs and competition between bodies providing services to the population. In the
process of this modernisation, progressive reforms have been carried out in Azerbai-
jan to introduce effective technologies of public administration culture and build a
professional civil service through the training and use of a new type of personnel.

As the digital divide in the Republic is largely determined by the specific nature of
Azerbaijani society, the ways to overcome it are inextricably linked to the legislative
activity of the state.   The national strategies of Azerbaijan aimed at supporting
ethnic, cultural and linguistic equality in multi-ethnic regions play a special role.
Internet use in Azerbaijan is held back primarily by the price, which is reportedly
high, as well as by the lack of Internet services and insufficient computer literacy
of the population. On the other hand, the rapid growth in the number of Internet
users is due to the projects on the development of the information society carried
out by state institutions and the active work of business entities. The government
in its various strategies provides for the achievement of a state of affairs in which
all members of society would acquire the competence that meets the requirements of
the information society. To accelerate the development of the information society in
Azerbaijan, projects are being implemented to bring Internet access points closer to
the population, thereby attracting the population to active public life. The current
level of application of electronic and information technologies in public administration
in Azerbaijan can be characterised as an *integrated web presence.* The use of modern
ICT in the public sector builds the foundation for the authorities to act transparently
and more openly concerning the population, and to involve the population in the
process of making important decisions. One of the main goals of information society
development is the formation of an active civil society.

Despite the difficulties of the transition period and the need to overcome crises related
to domestic transformations, reforms and modernization, Azerbaijan has actively
joined the process of building an information society. Moreover, it is the widespread
use of ICTs in various spheres of socio-economic and political activities that was
and is largely the key to successful and rapid modernization, allowing Azerbaijan to
come very close to the economically developed countries. It is evident that active
involvement in the initiatives of various international institutions bridging the digital

divide can assist Azerbaijan in overcoming both domestic challenges and expanding its influence abroad.

5.2 Recommendations and Policy Alternatives

The analysis of the condition, problems and prospects of the information society in post-Soviet countries presented in this work has confirmed in general the desire of states to improve and further develop the digital sphere, which is determined by the implementation of national and regional strategies, concepts, programs, and joint research and development in the ICT field. The rapid maturation of ICT, the basic segment of the information society, had a pronounced influence on the transformation of the past global economic model, rethinking the role of information in society and its relevance in the areas of education and economy, critical to the full development of the post-Soviet states. Undoubtedly, the level of development of the information society, e-democracy, and e-government, depends on many components - first, on the public management. It is the state that creates the necessary legislative, institutional, infrastructural and financial support for the development of the digitisation.

The telecommunications sector of various post-Soviet countries has evolved from a highly regulated state with a single state-owned monopoly operator to a liberalised market for a variety of high-quality services. The broadband network has become a highly profitable business with market potential and investment efficiency. One necessary condition for transitioning from the raw-material model of economic development to the innovative model is ensuring universal accessibility of ICT and services to all citizens of the country, which necessitates the development of a national communications infrastructure. Technology has shown its potential in various segments of development around the Republic. As results demonstrated, urban regions, with superior financial and digital literacy, exhibit a greater tendency towards adopting and utilising ICT compared to rural regions. Undoubtedly, effective e-government requires the installation of a strong communication system and the availability of the network even in most remote cities and villages. It is also critical to examine the quality and value of coverage for community members who have network coverage. Due to the need to provide cheaper ISPs to rural communities, most digital service platforms rely on the use of mobile devices. With the emergence of public e-services - in some areas, with no option for *traditional face-to-face* services - the affordability of broadband networks remains largely questionable for some rural communities. Thus, for Azerbaijani society, overcoming the digital divide is an important task not only of a technological but also of a social and cultural nature. Providing all citizens with equal access to the Internet and ICT in a multicultural and multinational country; ensuring the possibility of mastering digital technologies and infrastructure by all

citizens, regardless of the region of residence and other socio-demographic charac-
teristics; increasing the level of digital capital and digital inclusion of Azerbaijani
Internet users of different ages - all can be considered as important tools for building
a new society in which all citizens of the country have equal access to information,
equal digital skills and, as a result, equal opportunities for self-realisation and effective
activity in a digital governmental environment.

There is a need for further development of ICT as a priority field for the societal
development of Azerbaijan and the increasing demand for its e-government services.
More intensive implementation of ICT in rural areas and equalisation of their level of
digital development can improve the efficiency of the regional economy, the quality
of people's lives and country ratings. Ongoing work in these areas may ensure the
expansion of self-service opportunities for citizens in various spheres, promote their
technological awareness, simplify and shorten administrative procedures and reduce
the risk of encountering corruption (E. Abu-Shanab & Khasawneh, 2014; Ko et al.,
2013). To date, we can talk about high expectations for the use of ICTs in the
activities of government agencies on the part of individual citizens and organizations.
The processes of introducing e-government and digital access reform should be carried
out in parallel, in close interaction with each other and based on the same principles,
within a single model. As analysis showed, the introduction of similar practices
can contribute to improving the efficiency and expanding the boundaries of digital
interaction between the state and citizens, improving the quality of public services in
electronic form and increasing public satisfaction in both urban and rural areas.

A strategy for e-democracy and e-governance should be developed and implemented
at the Azerbaijani community level to enhance the relationship between the state
and citizens, to provide public services online, with mandatory respect for all hu-
man rights and freedoms, and digital literacy as one of the main methods to bridge
the digital divide should be at the core of these processes. To overcome the digital
divide, the state needs to involve enterprises in a unified ICT agenda for social ben-
efit, including the widespread deployment of network infrastructure; modernisation
of the telecommunications sector; and support for economic development through
technology. Some conditions are necessary to reorganise public administration in an
e-government paradigm.

All in all, digitisation in Azerbaijan is taking place in various directions, which can
be grouped into education, economy and governance. Thus, Figure 14 presents key
recommendations to bridge the divide of vulnerable residents around Azerbaijan, by
empowering both individuals and the community, improving access to digital tools,
and ongoing support in the use of public e-services.

Encouraging Digital Literacy and Educational Collaboration	1. Amendments to computer science curricula and improvements to ICT infrastructure in educational institutions.
	2. Development of regional and local centres of educational institutions that implement digital literacy programs, and their inclusion in the national educational network.
	3. Allocation of funds to universities and educational institutions in the implementation of digital literacy programs.
	4. Set up community centers in rural areas, equipped with computer devices and Internet access. These centers can provide training, support, and resources for residents to improve digital literacy.
Advancing Telecommunication Field	5. A liberalisation policy in the telecommunication sector, creating opportunities for free competition, formation of nationwide data carriers involved in the organisation and operation of data transmission networks and channels and creating favourable conditions for their operations.
	6. Development of nationwide networks, including the Internet for data transmission, and elimination of existing disparities between urban and rural areas.
Promoting Access, Collaboration, and Participatory Governance	7. Provide comprehensive training on the protocols governing the utilization of government digital services.
	8. Establish a collaborative forum where rural and urban municipalities can engage in knowledge sharing. This shared platform will facilitate discussions on digital inclusion policies, fostering greater cooperation and learning between the two entities.
	9. Public awareness campaigns to promote the benefits of e-participation. Educate rural communities about the opportunities, resources, and tools available for engaging in online platforms and decision-making processes.
	10. Provide pilot programs in both urban and rural areas to test the effectiveness and efficiency of e-voting systems: collect feedback from participants, electoral officials, and stakeholders to identify areas for development and challenges.

Figure 14   Policy Recommendations for Empowering Communities and Enhancing e-Governance in Azerbaijan (Author's Compilation)

As part of the provided framework, an inclusive digital literacy program can promote the safe use of digital technologies for access to all components: information, communication, e-government services, professional skills, training and financial services. Without the knowledge about the benefits, services and rights, many poorly educated people are not willing to take the time and use the services provided by the government. Consequently, awareness will be incorporated into every component of an inclusive system to increase motivation and participation. The literacy component of online government services can inform and offer easy access to relevant online government services. In addition to targeting students with low literacy levels, the system may also consider people with learning difficulties and disabilities. The main goal of the mechanism of the inclusive digital literacy framework is to empower the population through digital education, raise awareness of ICT and social services, and most importantly, improve the quality of life, increase sustainability and ensure equal access to public services. This system also provides equal opportunities for all residents of Azerbaijan's rural and urban regions, providing them with livelihoods and services through digital technologies. The Internet already automates the majority of tasks, yet a significant distribution of workers lacks the skills required to adapt to the new technology. As a result, now there is inequality in various fields, which hold the unavoidable prospect of unemployment and lost opportunities. Thus, digital literacy is not only one of the most in-demand areas but also an important factor in the development and implementation of innovation, as well as the development of society.

There is also a need to create appropriate conditions for the participation of citizens in public administration; as well as develop the use of ICT in the electoral process - the activity observed in Estonia, as an example. The rapid development of electronic voting systems abroad requires the development of domestic equipment to preserve digital sovereignty. At the beginning of the 21st century, there were tendencies to abandon the widespread use of traditional ballots in elections and transit to electronic voting. Due to the introduction of more convenient forms of voting, conditions are created to prevent a decrease in voter turnout, resources of election organisers are saved, and the speed of determining election results increases. The introduction of elements of e-democracy, in particular e-voting, can help consolidate Azerbaijani society by increasing the accessibility and convenience of e-participation practices and the accompanying increase in the positive outcomes of the active citizen engagement models. The result of the introduction of e-voting for the political system as a whole is a new level of citizen e-participation. A variety of ICT opportunities can provide a new quality of participation in politics, which, in turn, may contribute to the consolidation of different segments of Azerbaijani society. It will strengthen the

reputation of state institutions in the eyes of society through individual participation and civic engagement, such as electronic voting. Additionally, the practice of Internet voting can increase the turnout of young people and other non-participants who prefer to remain electoral abstainers.

In the transition of public services to digital, the importance of the human factor is not reduced but increased. The problem of access has been worked on at the state level for many years, but the research showed that the solution must be comprehensive. In addition to the development of infrastructure, it is necessary to provide comprehensive support in understanding and utilisation of Internet public services. Thus, in creating a system of electronic public services, the government cannot ignore the needs of citizens who, for various reasons such as technical (i.e., inaccessibility of services) or functional (i.e., lack of digital literacy or distrust), do not feel comfortable around digital technology. Thus, as a result of the implementation of the Framework (Figure 14), the intellectual and digital potential, telecommunication infrastructure and national electronic information space favourable for transition to information society can be formed; the Azerbaijani broadband network segment can develop further; and the integration of the Republic into the international electronic information space can be ensured.

While not all of the suggested policy measures may be immediately applicable to other post-USSR countries, the study and analysis of Azerbaijan's digitisation journey can be generalized to help similar governments with their digital inclusion. Additionally, the rural areas of Azerbaijan are just beginning to implement their regional programs of digital transformation. The conclusions of this study can be used to scientifically justify the programs being developed at the rural level to reduce the digital divide in the population.

5.3 Limitations and Further Implications

Although carefully prepared, this research study has its limitations and shortcomings as well. The Republic of Azerbaijan was chosen as a primary case study to provide an in-depth analysis of the relationship between the digital divide and e-participation, an area that is novel and recent in the literature. However, due to time constraints, the dissertation work was conducted within two to three months, which was not sufficient to do a more extensive data analysis, identify and clarify the main aspect of e-government participation and determine the root of the problem. Although enough respondents have contributed to this study, an even larger number of residents from distinctive regions of the Republic would have provided a more objective picture of the problem posed. After the data collection was finished, there was also a limited

time left to do further research, bring in some fresh perspective and cross-check the findings. The insufficient amount of existing literature in the chosen field has posed a challenge as well. While some studies have been conducted on the general state of ICT usage in the country, there is a lack of comprehensive research on the social, economic, and cultural factors that contribute to the digitisation of Azerbaijan.

Nevertheless, the paper can be a foundation for future works in the area of the digital divide; fellow researchers can utilise the findings of this dissertation for an in-depth analysis of the e-participation rates. The **theoretical significance** of the work lies in the conclusions formulated in the study, which make a certain contribution to the theory of digitisation of Azerbaijan and can be used in the formation and functioning of the innovative infrastructure of e-government, contributing to the overall change in digital policy and strategy throughout the country, as well as the wide application of innovative technologies in the remote regions of the country. The **practical significance** of the findings lies in the possibility of using the recommendations and conclusions in the practical activities of Azerbaijan in the elaboration of the strategy and the digital development program of the country. Understanding the nature and causes of the digital divide could inform policymakers in the development of more effective strategies for promoting digital inclusion and reducing inequality in access to technology. Thus, knowing the drivers of the digital divide can help bridge it.

In the author's point of view, further research on digital capital and digital inclusion should focus on several promising, but so far understudied, theoretical and practical directions. A synthesis of approaches to the classification of hybrid or unstable socio-economic systems based on new concepts of institutional theory and empirical analysis of framework conditions for development and quality of digitisation will help to better understand the specifics of e-government development in post-socialist countries. The diversity of trajectories, framework conditions and ecosystems of electronification, as well as strategies on the use of ICTs, should take into account the specifics of each particular post-socialist country.

6   Conclusion

Imagine living in a world where access to information, education, and employment opportunities are limited by something as trivial as geography. Where the ability to connect with others, access medical services, and participate in political discourse is dictated by whether or not you have access to the Internet (Graham, 2011). This is the reality for millions of people around the world who are affected by the digital divide. The emergence of the digital divide cannot be explained by a single component alone; rather, there is a complex set of factors that contribute to it. The gap is related to the need to own different kinds of social, financial and temporal resources: availability of income to purchase hardware and software; time available to acquire new ICT skills; and psychological factors contributing to technology adoption. Stemming from its Soviet past, these resources are unevenly distributed in Azerbaijani society, which causes inequalities.

Rapid urbanisation around the world has additionally wielded significant pressure on infrastructure and services within urban and rural areas. Notably, global cities currently accommodate over half of the world's population (Valiyev et al., 2022). As such, the movement and accessibility of urban residents within and between cities have become crucial considerations. Providing Internet connectivity, communication networks, and other essential systems has emerged as a paramount challenge. The importance of research in this direction stems from the fact that the impact of the digital divide on human inequality is enormous - much greater than the impact of technical inequality or unequal access to television, radio and telephony. This is due to the fact that modern ICTs are multifunctional and multitasking, permeating all areas of human life: work, personal life, communication, entertainment, education, health care and finally, public services. In addition, there is the so-called *network effect*: the more people get access to a broadband network, the more valuable it becomes.

The information society today reflects the problems of social relations: while it has a strong internal democratic potential, making it possible to make any public institution or private company open to citizens through the disclosure of and access to a variety of information, this society has once again become heterogeneous, divided into strata of the rich and the poor. The idea of digitisation as a new stage in social development has been heavily disputed for many reasons, as it has revealed not only new possibilities but also new obstacles that have stood in the way of social progress. Today, tackling the divide needs to be on the agenda of every country. If you think about the level and pace that technology is moving and the jobs that are needed to push the globe

into the next generation; if the majority is digitally illiterate or lacks access to ICTs, the country can't connect to these opportunities.

As such, this dissertation study has attempted to shed a light on the complex dynamics of the digital divide and its impact on citizen access to public e-services in rural and urban areas of Azerbaijan, allowing to answer the main research question of: *To what extent does the digital divide impact citizen access to public e-services in rural versus urban areas of Azerbaijan?* While efforts have been made to provide equal access to ICTs across the country, to this date various factors contribute significantly to inconsistencies in e-participation among residents. Every resident has the chance to contribute their knowledge and help prioritize both local and national issues. Findings analysed in the study show the existence of groups of individuals who wish to be involved, take action to improve the work of the government while also defending their own interests. Although Azerbaijan offers a variety of e-government services, their quality cannot be recognized as high for many reasons such as low demand for public e-services, unequal interaction of government and society and the low level of citizen involvement in the management decision-making process.

At present, effective public administration is impossible without citizen participation. The majority of Azerbaijanis are undoubtedly already online, but the public sector may offer more chances for citizen contact, involvement, and collaboration to start a higher level of e-participation. The development of ICTs makes it possible to involve members of the public in the process of making management decisions most quickly and at low cost. Evidently, the Government of the Republic of Azerbaijan pays serious attention to increasing the list of e-services, but in addition to this it is worth considering improving the ICT infrastructure, taking measures to improve the development of human capital, increasing e-literacy of citizens to realize the benefits of online and mobile services. An important task is the involvement of successful citizen initiatives in the architecture of e-government, so that political, organizational and resource support can be provided. Knowledge and consideration of the factors that influence the success of e-participation of citizens increases the effectiveness of interaction of the population with the authorities by means of ICT. Factors may vary depending on a number of circumstances such as the economic situation in the country, the political system, or the development of e-technologies.

The mechanism of digital inequality's impact on the quality of life and national security is similar to the one of economic inequality. At the same time, the divide, or, more precisely, the state of digital development unequal to the global examples, is both a cause and a consequence of the economic, technological and scientific lag. Thus, we can assume that the digital gap is a certain mechanism of negative feed-

back to contain the levelling of global development. The digital divide is narrowing, albeit very slowly. Consideration of this inequality as a cross-border threat to the national security of Azerbaijan should include a definition of inequality in the level of development of data technologies, including artificial intelligence technologies, as well as the level of digital sovereignty of the country. Soon, it is the difference in the technological levels of the leading countries-poles of political, economic and military power that will largely determine the state of the system of international relations.

ICT today is a key driver of socio-economic development; therefore, the difference in the level of technological capabilities or the *digital divide* is simply becoming socially and politically unacceptable. A proactive policy for the development of digital capabilities is required to enable the population's progressive adaption to the new digital reality. Regions must be able to regulate the impact of digital platforms on the realities in which they exist. At a time when digital connections and abilities dictate equitable opportunities and levels of provision of social rights, such as education, job, health care, accessibility, and public services; access and use of ICT must be available for everyone.

Certain situations may not cross paths in our daily lives, but this does not imply that these obstacles do not exist. The intention of this dissertation work was simply to bring these problems to attention and make them more visible. It is unacceptable that individuals from under-informed geographic areas experience a rather *different life* in terms of their access to social and economic opportunities. It is critical to understand that e-government is designed to help people reach a greater level of life in all its spheres. Worldwide experiences showed us that there has never been complete harmony in the relationship between the state and civil society - nevertheless, a successful movement towards information society is only possible with mutual interaction. Bridging the digital divide is not just a matter of fairness or equity, it is an essential step towards creating a more just and prosperous world for everyone. As quoted by William J. Clinton:

> It is dangerously destabilising to have half the world on the cutting edge of technology while the other half struggles on the bare edge of survival. (Bozkurt & Sharma, 2020, p. 3)

Thus, Azerbaijan must embark on its long historical path towards ensuring digital accessibility for everyone and everywhere.

A Appendix

Interview 1

Date: 19.03.2023

Length: 18:00 mins

Language: English

Q1: Can you introduce yourself? What is your area of research/interest?

AV: My name is Anar Valiev, I'm an Associate Professor of Urban Studies and I'm working at ADA University. My area of expertise is urban planning, development, and sociology.

Q2: In your professional opinion, what is the current state of digitisation in Azerbaijan?

AV: I would say before the pandemic the state of digitisation was very low. There was approximately only 5 per cent of all trade in Azerbaijan that was conducted on e-commerce platforms. Digitisation was not at a high level because most of the governmental and business affairs were conducted paper-based rather than digital-based. So, digitisation started to take fast steps during the pandemic and right now I still don't consider this a full digital society, but it's much better than we had five years ago.

Q3: How have recent efforts to digitise government services and processes impacted citizens and businesses in Azerbaijan?

AV: Yes, the efforts of digitisation impacted the life of businesses and society in Azerbaijan, especially taking into consideration the electronification of many services, digital administration services. For example, the recently established e-Notariat system allows us to give a certain type of documents online. You don't need to go physically to another space, you can do it online; paying taxes, doing certain types of courses, sending payments and so on. I think it's positively impacted the lives of people.

Q4: Are you aware of the concept of digital divide or digital inequality?

AV: Yes, I'm aware of the digital inequality in Azerbaijan, especially the dichotomy between urban and rural areas. Not only urban and rural, but even between the cities of Azerbaijan. I would say the best situation is Baku. But while the other cities of

Azerbaijan have very low digitisation, I'm not talking about even rural areas. It's completely where the penetration of the digital service is extremely low.

Q5: What are some of the challenges you think Azerbaijan faces in its efforts to become a more digitally advanced country?

AV: I think the biggest challenge that Azerbaijan is facing today is just infrastructure and massive investments into the infrastructure of digitisation in the country. And the second thing is harmonization of the public administration system. We have huge problems with the public administration system and that's why you know the first things we need to do is to harmonize the public services that we don't do at this current stage.

Q6: How, to your knowledge, Azerbaijan compares to other countries in the region, or globally, in terms of digitisation progress?

AV: Well, I think if we compare Azerbaijan to, let's say, Turkmenistan or Uzbekistan or Tajikistan - yes, we are advanced. But if you compare ourselves with Georgia, Armenia or other former Soviet Union republics well except Russia and Ukraine and Belarus. So I would say that the digitisation in Azerbaijan is far behind these countries. So I don't think that we are ahead of that.

Q7: How do you think the digital divide affects different sections of the society in Azerbaijan, such as rural vs urban, women vs men, and young vs old?

AV: Well, the question itself is already posing that this is a problem. There's a huge discrepancy between urban versus rural. There's definitely a big discrepancy between old versus young generation of people. The younger generation using this service is much better than the older generation. I wouldn't say that there's a huge divide between females and males in Azerbaijan. I would say it's more about geographical and age type of thing, rather than gender.

Q8: How do you think COVID-19 pandemic impacted the digital divide in Azerbaijan?

AV: Well, I think the COVID-19 affected positively and negatively. First of all positively is the fact that the people began to use electronic services much more frequently - allowed the people to become digitally aware of that situation. What is a negative thing is that urban areas were impacted, I don't say less, but they were able to recover fast compared to rural areas which lost a lot of their farming, production, sales and so on.

Q9: Are there any particular regions or demographics in Azerbaijan that are disproportionately affected by the digital divide?

AV: Oh, I think Baku and Absheron peninsula are much more advanced than any other region of Azerbaijan. I would say that beyond Baku that all other regions equally are behind the capital.

Q10: Looking to the future, how do you think policymakers and stakeholders can work to bridge the digital divide in Azerbaijan in the years to come?

AV: Well, the Internet is one of the main resources that allow Azerbaijanis to somehow reach a bridge, somehow to close the gap of income inequality. I think access to the Internet is, I would say, should be one of the rights of the people similarly, because today people don't watch TV anymore, don't get information from newspapers. So the Internet is becoming the only resource from which they can just get information, and what can the government do to bridge the gap is just the first of all to build enough infrastructure for this type of the situation.

B Appendix

Interview 2

Date: 05.04.2023

Length: 28:10 mins

Language: English

Q1: Can you introduce yourself? What is your area of research/interest?

VK: My name is Vusal Khanlarov. I'm the head of the Bureau on ICT for Education. Uh, the bureau is part of the Ministry of Science and Education. We are dealing with all aspects of it in education, starting from building the infrastructure in the schools and connecting them to the Unified Azerbaijan Education Network - an intranet. We manage the largest intranet in Azerbaijan after the traffic lights. Traffic lights have 10,000 points of presence. We are 4000 schools that are connected to a single network. Some other activities that we're doing are building information systems and e-services for citizens. We're also involved in teacher professional development, a very small portion of it, but still, we're training teachers on how to use ICT in education, and we are developing content in Azerbaijani the for the students free of charge and teachers to be used. So this is basically what we do. Our bureau was established back in 2007 and we continue since then. Uh, can I move to the second question?

Q2: In your professional opinion, what is the current state of digitisation in Azerbaijan?

VK: This is a very general question, I would say. I think we as a young country are making big leaps in terms of digitisation in the government in Azerbaijan. The latest infrastructure projects that are bringing, uh, broadband connectivity to homes is quite remarkable. The Ministry of Digital Transformation and Transportation is working in that direction in quite big leaps. If you look into overall digitisation, what is needed for digitisation of any country? First is infrastructure. And in that sense, the government is investing funds. I'm sure you can research on the Internet and find how much investment was recently put into infrastructure development. So that is basically the fundamental part of digitisation. After that, uh, a big part of the digitisation is process re-engineering. We have to re-engineer the processes that will serve the citizens. We have to re-engineer the processes that businesses serve. The citizens and citizens interact with each other. So all these processes need to be

re-engineered so that they can be digitised. And after that the processes are being digitised in a way that the students, the citizens and the businesses and government get services with their fingerprints. So, the services become easier and because they know you already, they become more personalized and support our daily activities and increase the speed. These are the positive parts of digitisation in Azerbaijan. I would say the challenges would be we are slow and behind some of our neighbors. If you look into the innovation index where Azerbaijan is, we actually decreased within that index and went backwards. The reason is not that we closed any projects or major initiatives. The reason is that other countries were able to make more steps towards improvements. Therefore, we need to catch up. And for that, I think we have the resources in terms of political support and will make this country digitally advanced. We have the infrastructure funding that we're putting in place, and we are well positioned with international stakeholders that we can bring the best practices and partnerships to the country. So yeah, while we are lagging, my personal humble opinion is that we lack coordination between the government and private sector. The government works on its own. The private sector does something on its own. There needs to be more coordination and understanding. Why do we need digitisation? You cannot do digital transformation just for the sake of it or because it's fashionable. You cannot go in that direction. I think there has to be an agenda. Basically, in Russian it's "zakaz" - the order. Why do we need this digitisation and what it will serve? So I think that's very important to have.

Q3: How have recent efforts to digitise government services and processes impacted the citizens of Azerbaijan?

VK: I think with the government services we came to the place where we thought we basically provided the citizens with self-provisioning services. Citizens can access many services that do not require any clerk or any government official to be present at the same time. I think what we were not able to do well is now I'm going back to that re-engineering process - many services were digitised as they are. So if a certain service on paper consisted of steps one, two, three, four and five, the digital service consists of the same steps, so it wasn't really improved to make the citizens' lives easier. I think that is phase two. We need it. It's quite normal if you look into the Korean experience or the Estonian experience and others did the same. They first digitised the current processes and then they started to innovate and change the processes so that it is more efficient for a citizen, but currently we are more in a place where we are digitizing step by step many services. What is missing? I think the process of re-engineering and sometimes we are missing the self-provisioning part as well. Many services at the end require that you take, you pass through the digital service, but at the end, you take a paper to the school. Let's say, uh, why did we

digitise it? Uh, so we need to again, this all comes because you cannot digitise or transform the services just for the sake of it. There has to be a goal. Why are you doing it?

Q4: What impact do you think COVID 19 had on innovations and digitisation across the country?

VK: Well, this is my favorite topic because I personally was involved in the COVID 19 response in terms of the education that was the most stressful, but at the same time productive two years that we during COVID, we completely redesigned the way we taught to the students and we did it in general education. We did it in higher education and vocational education. You probably heard of the Virtual School project that we implemented back then, again with many difficulties, but I think the result was quite remarkable, so that, you know, we understand the reality and the benchmarks and the baselines. Before COVID 19, we were training about 4000 teachers per year to do it in education, training it in education in their classrooms. Out of them, around just 20 of them used the resources that were provided. So you can understand how small that number was. In reality, with COVID 19, we provided seminars, no training, but just at all digital seminars, virtual seminars to more than 50,000 teachers. The rest already figured it out on their own, but those who couldn't, we did seminars for them. Around 50,000 people participated, 120,000 teachers. 98 per cent of teachers registered on our platform and used it. Some were more active than the others, of course, but at least they tried. We had 1.4 million students registered on the platform and used it as active users. 1.4 million is out of 1.6 million students that we have in general education out of 52 higher education institutions, 47 switch to online. They had their own digital platforms or who didn't have the platforms. We provided them with Microsoft teams and things like this. I remember one statistic in January 2021: in one week, the teachers in Azerbaijan held 1 million classes. Uh, in just one week, 1 million lessons were done by the teachers. So because of the circumstances and because we provided the necessary support, we made the big leap. So from 4 to 2000 teachers to all teachers and, uh, I would say more than 80 per cent of students. So COVID-19 changed big time. What we were able to do is digitally we digitised each identity of a student and teacher in what that means that each teacher and student was registered on the platform and was receiving his or her own identity so that we could track how the teacher or student is doing and support them. Throughout the journey, we did various study programs using AI. We predicted, uh, student test results considering how they did on the uh, on the virtual platform. So now we can actually predict, uh, results of our students or teachers if we track them online. We have all those tools and technology, so in that sense, if I take education, uh, I remember the times when, you know, "Alexa" has its

own rating system of most visited websites. During COVID 19, the virtual school platform was in the top three in the country. Our platform was larger than Facebook users in Azerbaijan, so it was quite a big, uh, uh platform. After COVID 19 is down, of course we don't have that many users, but the good news is that around 20 per cent of students and teachers still use the platform, They still interact, they still do something on the platform. It's not full time, of course, but some teachers still got that. They liked what they saw and they're using the platform for homework. They're using it for tests, they're using it for student assessment. So many things are still happening on the platform, of course, on a much smaller scale. And I think the biggest impact was that we started buying computers to the schools because before that it was very hard to get money from the government to buy computers for the schools following COVID-19. The conversation is much easier.

Q5: So, if the lockdown hadn't happened, do you think that these innovations in the education sector would have happened this quickly for the country?

VK: No way. Because I've been working in this job for four years. Before COVID and the last I worked for four years in my current job before COVID. And I worked my whole career, more than 20 years in education. And I have experience in mobile telecom, IT and education, throughout my career, I've never seen such a progress. Nothing could spike this innovation this fast as the circumstance and the need of the lockdown. Yeah, unfortunately, this is it.

Q5: How does Azerbaijan compare to other countries in the region in terms of the digitisation process?

VK: I think here it wouldn't be wise if I would say any of my opinions because it would be very relative opinions. I think here you need to look into the innovation index and from that see where Azerbaijan is because it can be very speculative. You know, since I am in daily work, I can say that we're doing a lot of great stuff. But when it doesn't change the economy of our international index, I'm spending all my day doing this job so I recommend here to look into the indexes.

Q6: What is the current level of digital literacy among students and educators in Azerbaijan and how does it impact their ability to effectively use technology in the classroom?

VK: Again, we have our own understanding and benchmarks, but the right thing would be to look into international studies. There is a PISA study that doesn't really look into digital literacy, but it looks into, , math, reading and science. And you can see how Azerbaijan is there compared to OECD average compared to the regional countries. I recommend going into that. Pisa has its own website. You can

take a look at that. This year we will be doing a Teams and ISIL exam which will be evaluating the digital literacy of students. It's the first time in Azerbaijan that the Ministry of Science and Education is performing it. We're getting ready for it. Then it will be right to comment on this question. , what I can say is what we are doing to increase digital literacy. We have a digital skills project that we started with 6000 students back in 2017 and we're now reaching 300,000 kids right now in 400 schools. You can check their website. It reconciles our digital literacy project. We basically removed the old informatics class, which was really not teaching us anything and replaced it with modern digital literacy and coding classes where in lower grades they learn digital literacy and in higher grades they learn coding, programming and coding. So, that project is increasing quite fast. We're retraining the teachers, we're providing computers, we're providing connectivity, and all of the classes happen 100 per cent online. It's happening all online. Uh, students use the learning management system to learn. Another project is STEM education. We are teaching applied digital skills through STEM. Stem project has reached about 200,000 kids already.

Q7: How can educators in Azerbaijan ensure that students from disadvantaged backgrounds have equal access to digital resources and technology?

VK: One thing that we observed during the COVID period, we did this study using Microsoft's AI tool, which is now called Chat GPT. But that engine was made available to us a couple of several years ago to analyze what affects student learning. What we did is we took all data, anonymous data of students, what they do while they're learning online, and we run three tests throughout the year. We took all this data and put it together into AI to tell us which of the activities of the students affect their learning more than the others. And there was this rating. Geography wasn't even in the top three. Geography didn't really matter when you provided it because everyone was at home and everyone was provided with the same access to the Internet. Well, some students didn't have any access to the Internet, so we didn't really look at them because unfortunately, you cannot do that study without a digital footprint. But when technology is provided to everyone equally and there is centralized teaching, uh, we saw that the number, the hours or minutes the students had their microphone open affected their learning more than anything else. Uh, the second place, if I recall correctly, was the number of times they use online whiteboards. And the third was just the number of lessons the person participated in. Number four was geography. So what that tells us during those, uh, a year and more than a year of lockdown, when everyone is provided equal access, it looks like there is no really there's no difference if you are from an advantaged or disadvantaged background. So I think that's told us something. And what we are doing right now after this, the COVID-19 period, we're working on several initiatives where we have lots of schools

where no teachers are present or there is one teacher that teaches various subjects. Uh, we're thinking about a way to make distance education in those, uh, villages and remote areas because otherwise, of course, the social impact, social communication is very important. However, if a student doesn't get the right quality material or teaching, they cannot be successful in the future. So we're looking into ways to get distance education into the remote and disadvantaged areas.

Q8: How do you think digital inequality affects different sections of society in Azerbaijan, such as rural and urban?

VK: Of course, in education, that can be seen. I think digital inequality, first of all, you can see it in education because it's digital means the students obviously are more successful. Inequality also affects the future, soon it will be seen in the health sector as well as the health sector being digitised in unequal access will be affecting the access to health services in the future. But right now I think the education kind of stands out where inequality can be seen quite well.

Q9: Looking to the future, what policy measures do you think are important to bridge the digital divide in Azerbaijan?

VK: Again, I will repeat myself here, but again, I think making the digital infrastructure available is number one. Without the digital infrastructure, connectivity and devices for each citizen, we cannot talk about digitisation. Again, if we look into the Korean, Singaporean, Estonian, Finnish experiences and many more - it all starts with the infrastructure. So big investment into infrastructure is required. Some sort of program needs to be there so that every citizen gets a device. Without it, you cannot have proper digitisation. And number three, I would say, is coordination and coordination, because coordination is crucial. When I say coordination, it's not the centralization, but really the coordination of measures so that all services are developed for the citizens and not for the ministry or for the South. And personally, it has to be for the citizens to make their lives easier, not to make our jobs easier. And the final I would say policy measure would be an investment into education. Of course, it sounds quite obvious, but it is important to keep up with the innovation, with education investments, so that our kids get content better than we did in the past. And the truth is that, , and our minister said that during his latest public appearance that really the kids right now receive better digital education than we did when we were in the school. And that's the fact already. So we need to continually invest so that the next generations get better access to education as well.

C Appendix

Interview 3

Date: 24.04.2023

Length: 32:50 mins

Language: Azerbaijani, translated to English

Q1: Can you introduce yourself? What is your area of research/interest?

AV: My name is Aziza Vidadi, my main activities in the past 5 years have been the digital transformation of the government, digital government, the application of electronic and digital services to the Azerbaijani environment, as well as the study of international benchmarks. We participate in the organization of digital projects. In particular, in recent years, I have been engaged in providing support in the preparation of strategic documents and research in the application of these fields - Artificial Intelligence, machine learning, data analytics.

Q2: In your professional opinion, what is the current state of digitisation in Azerbaijan?

AV: I think that the process of digital transformation is still on-going in Azerbaijan, considering that Azerbaijan is a very young country, it was one of the countries that successfully passed the digital transformation process among the post-Soviet countries. The beginning of the government digitisation covers the years 2003-2013 in Azerbaijan. Here, during this period, government services were provided in a retail form, the first steps of the transition to the new electronic government were taken, and preparatory work was carried out. Later, in 2013-2019, electronic document transfer into one-stop shop format. The main driving event in this was the creation of ASAN Service. Although ASAN itself was not a service provider, it was engaged in providing its services to volunteers of several government agencies in one place. This was a token that ensured transparency and better and more personal satisfaction of services. At the moment, President Ilham Aliyev has been at the opening of ASAN Service in the Salyan region and stated that the establishment of ASAN Service in Azerbaijan is ensuring transparency in the provision of government services. Considering that the satisfaction of citizens in the ASAN Service center was 99.8 percent, it means that the ASAN Service model can be considered as a successful innovation for the country. In the next years 2019-2022, there was a transition to digital services, the government changed to a new platform - an electronic portal was created in the format of *mygov.az*

personal cabinet - here citizens can get to know their information and even have access to the feedback model. This process was one of the important ones in terms of citizen engagement. For example, my mother and father were not visible in my personal cabinet online under the family information, only my sister and my partner. So, I used the feedback section, where I typed in my family's FIN codes (personal identification code) and all of their information such as birthdays, names; sent in and the according State Service has gone through it and after some time updated it on my personal cabinet. The last stage of the digital development process started in 2022, it is impossible to know exactly for how long, but there is a social and economic road map that covers the years 2022-2030. At that time, the government is planning more non-stop shops with new technologies such as blockchain, AI; whichever technological innovation in the provision of relevant government services can show better results - by making predictions, it will make the old system more successful. Currently I think Azerbaijan has already come a long successful way for these achievements.

Q3: How have recent efforts to digitise government services and processes impacted the citizens of Azerbaijan?

AV: A bit similar to my previous response, I can say that the Azerbaijani government is trying to adapt each public sector enterprise to the world standards via the help of new technologies - several road maps, documents, strategies have been prepared. For example, the 2022-2026 social development strategy can be mentioned; AI strategy is currently being prepared with the support of the Fourth Industrial Revolution Center under the Ministry of Economy. Azerbaijan 2030 national priorities for social development do not generalize in any field; the application of innovative technology in education or economy is emphasized and works are being done with cooperation with other countries. The presidential decrees happening in Azerbaijan are being consulted with international cooperations, for example - the World Bank's gov tech report and the UN's electronic AI government readiness index Then, the global innovation index. You can probably notice from some indexes, esp EGDI, that Azerbaijan is still lagging behind many countries - but you should consider that every year during the development of these indexes there is a certain methodology that is changing and some sub-indexes get added. Azerbaijan is trying to match these new methodologies and indexes.

Q4: Can you provide examples of successful e-services that have been implemented in Azerbaijan?

AV: Especially in recent times, the work done in the field of e-government or public services has been mainly based on the events of a person's life. That is, from birth to death, a person is adapted to what stages and services he can use. For example,

here we can take an example, as I noted again with *mygov.az* Personal Cabinet-based e-government portal. Here, by going through video recording with "ASAN login", through artificial intelligence-based video recording. You can control your *mygov.az* Personal Cabinet, and at the same time, you can get acquainted with a number of government services, that is, government services offered and provided by a number of government agencies. For example, there is the EAGRO e-banking, created specifically for farmers. In order for them to be able to apply for subsidies, EAGRO implements the application of electronic agriculture, information system, satellite-mediated area calculation, which product will be more productive in that area, i.e. high-tech applications. Then there is the ASAN Visa, which is an electronic visa system. People who want to come to Azerbaijan, those who do not have citizenship can get an electronic visa within three hours or three days by applying to the visa point to point service and can easily enter the country. In other words, there is also a version of visa for travel upon arrival, which can be used by foreigners who have entered the airport. They can have an electronic visa even in the period of the European Games, even in the period of the formula, in a matter of seconds. Such an arrangement is made, for foreigners, then there is a lion payment, which is a single payment system. Here you can pay utilities. At the same time, the payment of fines was available in accordance with the protocols written by the state traffic police, and a number of public services, i.e. fines and service fees can be paid here. Then, the digital executive power is a system created recently, where citizens can use electronic services to apply to the executive powers of their region without coming to the capital itself. Then there is the ASAN Finance system, where the banks can see the details of the citizen, but only with the permission of the citizen. And what is the meaning of this, that is, they can use any service. There is an e-procurement project, which is a unified Internet platform for public procurement. Here, too, the main purpose of creating this portal was the introduction of transparency and protection of transparency. Then the main projects were from the Ministry of Labour and Social Protection of Population. There is a pension calculator here for pensions, the pension system, that is, what services are included in the system. Then there is the data related to your perceptions. It is also suitable for use in state institutions, which are active in that organization, the contracts of the labor organization, i.e., by entering and conducting food inspections, etc. they are whining.

Q5: How has the COVID-19 pandemic affected the e-government project and its implementation in Azerbaijan?

AV: Of course, the effects of the COVID-19 pandemic did not escape Azerbaijan. However, proactive reactions by government agencies have made these effects less disastrous, that is it should be noted that during the period of the COVID-19 pan-

demic, the great progress in the use of electronic services by citizens should not be overlooked. Therefore, during this period, several projects were carried out and systems were formed. The problem was because it was a system of receiving electronic fines from the systems, and the institutions recorded the activity and the attendance of the employees who were considered very important. At the same time, a version of this system for citizens was prepared, where citizens enter their personal details in the dialing number 03 and use it to meet their daily needs or to restore their participation in unavoidable cases. When we say cases that cannot be excluded, the issue is, with the application of this system, a great progress was made in the system of a number of labor contracts, that is, in the process of obtaining state registration of contracts, which led to transparency. Then, for example, take a moment from this, I mentioned earlier that there were positive results from using the ASAN login system and the *mygov.az* portal, and it can be seen in the statistics that citizens already felt that the transition to a digital government is a kind of COVID -19 situation - with government support, they feel more involved. In addition, in that period, i.e., in the summer season, a system of permits was formed for access to the beaches. Here, people who have a COVID-19 passport could use the beaches that were previously designated. At the same time, other, for example, informational portals were created, of which there was less than one coronavirus info point. Here is some information about the COVID-19 virus, its regulation, statistical indicators related to the situation in the world as well as in Azerbaijan. Then any frameworks etc. adopted by the government of Azerbaijan. such information was shared. Then the stay-at-home contact-less platform was created, which, therefore, created an opportunity for citizens of the country to obtain public services and electronic services from a single source, as well as resources for e-learning. Later, it was not overlooked that late-stage entrepreneurs were given financial assistance to the economic growth and entrepreneurs within the framework of the state establishment and measures mechanisms. This was done by *mygov.az* alone. Then a mobile application was created, where you could also get information about whether you have been vaccinated or when your next vaccination is expected. You could read the statistics of the world and Azerbaijan, that is, the statistics of the infected districts, as well as the information about the pandemic of the World Health Organization.

Q6: How do you think it's possible to monitor and evaluate the effectiveness of the e-government project in terms of citizen satisfaction and usage rates?

AV: We can currently observe cases of increasing citizen satisfaction and increasing citizen satisfaction during the use of new state services. If we consider that the information system of the electronic government is a kind of non-stop shop model, and through this model, citizens get the chance to use the electronic guide to government

services, and if we consider that this model is an electronic version of the one stop shop model before its introduction - this already has a positive impact. Whether during the pandemic period or after, there is a significant increase in the use of electronic services by citizens. Either it shows itself in the comments received on the posts of government agencies that promote government services on social networks, or in the questions received by the health care centers. It also showed that citizens prefer to use electronic platforms in their daily basis due to working times or locations. Overall, to increase the citizen engagement, government agencies should take promotional steps, either in the regions or in the capital. Promotional training may be given to physically disabled groups or in general at universities and workplaces. In a mobile form, wires can be used to inform our citizens living in rural areas in a certain remote area. Government agencies can share informative posts or videos about the government services they have offered, which creates positive trends among these people, and at the same time, sharing information allows for feedback from citizens, which is now citizen engagement.

Q7: What are some of the challenges you think Azerbaijan faces in its efforts to become a more digitally advanced country?

AV: Challenges are the digital divide in the whole world and in Azerbaijan as well. The residents of the capital are more informed about the existence of electronic services or about the topic of digital transformation reforms in the country. Accordingly, in the regions where literacy is lower, as we are familiar with the reports made by international organizations or the regime government, the following can be applied: workshops, training, not only in capital but also in regions - hackathons, seminars. In particular, there is a certain age group that would benefit from this information, because they should have understood that it would be more effective for them to use the services by just connecting to the Internet without leaving the house, making use of their limited time and resources. Our biggest obstacle is the digital divide. A lot of great work is being done in this direction in the country, either in the private sector or in government institutions, but I still think that it can be increased in a more effective way.

Q8: How, to your knowledge, Azerbaijan compares to other countries in the region, or globally, in terms of digitisation progress?

AV: In the field of digital transformation of Azerbaijan, the issues that are going on in particular are the first electronic government construction, and the second is the Internet network infrastructure, which caused these special effects. For example, in the EGDI 2022 report, Azerbaijan was in 63rd place among 109 countries, which was similar to Turkey, Georgia and Armenia (in the region). At the same time, 2022

World Bank statistics showed that the broadband penetration rate in the country was about 37.6 per cent, and Georgia and Iran showed an even higher rate.

Q9: How do you think digital inequality affects different sections of society in Azerbaijan, such as rural and urban?

AV: Of course, there is a digital divide and digital literacy problem in Azerbaijan, as in all countries. For example, the residents of the capital are more informed about the services provided by state institutions or private institutions, because as you move away from Baku and go to more distant places, this digital literacy decreases or sometimes doesn't even exist at all. Some workshops are taking place in order to increase the information knowledge, but I personally think it is still not enough and even more training is required.

Q10: Looking to the future, what policy measures do you think are important to bridge the digital divide in Azerbaijan?

AV: I think many workshops should be taking place to increase the information knowledge of the population. Among the issues of teaching, teaching of digital literacy subjects, the simplification of the design of public services, the application of modern technologies in the digital transformation department, i.e., they should have a successful experience. And can be the cause. Later, conducting training in our inaccessible zones in the form of morning training or providing information and encouragement by the competent state institutions can have a positive effect. Even if necessary, they can be used here with the support of various organizations. In particular, that is, the UN, the OECD, the World Bank are signing very big projects in this direction. I think that even with the benefit of experience, this awareness can be used to overcome the digital divide in a more effective way.

Bibliography

1news. (2022). Winners of the "hour of code: A step into the digital future 2022" contest were awarded. https://1news.az/news/20221226074759924-Nagrazhdeny-pobediteli-konkursa-CHas-koda-shag-v-tsifrovoe-budushcee-2022-FOTO

Abu-Shanab, E., & Khasawneh, R. (2014). E-government adoption: the challenge of Digital Divide based on Jordanians' perceptions. *Source: Theoretical and Empirical Researches in Urban Management, 9*(4), 5–19. https://doi.org/10.2307/24861514

Abu-Shanab, E. A. (2011). Education level as a technology adoption moderator. *ICCRD2011 - 2011 3rd International Conference on Computer Research and Development, 1*, 324–328. https://doi.org/10.1109/ICCRD.2011.5764029

Acilar, A., & Sæbø, Ø. (2023). Towards understanding the gender digital divide: a systematic literature review. https://doi.org/10.1108/GKMC-09-2021-0147

Adam, M., & Keijer, S. (2023). Sanctions on the Russian digital sector: How effective are they? https://epthinktank.eu/2023/02/06/sanctions-on-the-russian-digital-sector-how-effective-are-they/

ADB. (2018). *Azerbaijan: Country Digital Development Overview* (tech. rep.).

Ahmadova, S. (2020). Teaching methods in the epidemic period in Azerbaijan. In *Economic and social development: Book of proceedings* (pp. 447–451).

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Porcesses, 50*, 179–211.

Akiwumi, P. (2022). Digitalization as a driver of structural transformation in African LDCs. https://unctad.org/news/blog-digitalization-driver-structural-transformation-african-ldcs

Alam, M. K. (2021). A systematic qualitative case study: Questions, data collection, nvivo analysis and saturation. *Qualitative Research in Organizations and Management: An International Journal, 16.* https://doi.org/10.1108/QROM-09-2019-1825

Alexey Sidorenko, B., & Geybullayeva, A. (2010). The Internet in Azerbaijan. *Caucasus Analytical Digest, 15*(10), 4.

Alimova, M. (2022). Turkmenistan's constructive initiatives for peace and development.

Aliyeva, J. (2021). Director of algorithmics school: Azerbaijan began transforming its computer science class earlier than others. *Report.az.* https://report.az/ru/nauka-i-obrazovanie/algoritmika-azerbajdzhan-nachal-transformirovat-urok-informatiki-ranshe-drugih/

Alomary, A., & Woollard, J. (2015). How is technology accepted by users? A review of technology acceptance models and theories. *The IRES 17th International Conference.*

Asgarova, B. (2021). *E-Government Technology Transfer Project from Developed to Developing Countries. A Case Study of the Implementation of the ASAN Imza (Mobile ID) in Azerbaijan.* Westfälische Wilhelms-Universität. Münster.

ASIS. (n.d.-a). Availability of computers in households. https://azstat.org/statHtml/statHtml.do?orgId=994&tblId=DT_CC_010&conn_path=I2&language=en

ASIS. (n.d.-b). Groupping of urban and settlements by number of population at the beginning of 2022. https://www.stat.gov.az/source/demoqraphy/?lang=en

ASIS. (n.d.-c). Information society. *Department of Information Technologies of the State Statistical Committee of the Republic of Azerbaijan.* https://www.azstat.org/portal/tblInfo/TblInfoList.do#994_027

Auerbach, C., & Silverstein, L. B. (2003). *Qualitative data: An introduction to coding and analysis.* https://doi.org/10.5860/choice.41-4324

AzerNews. (2022). Minister: Azerbaijan eyes providing extensive ict incentives, becoming regional hub. *Azernews.az.* https://www.azernews.az/business/204533.html

AzTelekom. (2022). GPON technology introduction starts in Guba region. https://www.aztelekom.az/en/read/177-gpon-technology-introduction-starts-in-guba-region

Azungah, T. (2018). Qualitative research: Deductive and inductive approaches to data analysis. *Qualitative Research Journal, 18.* https://doi.org/10.1108/QRJ-D-18-00035

Balki, E., Hayes, N., & Holland, C. (2022). Effectiveness of Technology Interventions in Addressing Social Isolation, Connectedness, and Loneliness in Older Adults: Systematic Umbrella Review. https://doi.org/10.2196/40125

Baskarada, S. (2014). Qualitative Case Study Guidelines. *The Qualitative Report.* https://doi.org/10.46743/2160-3715/2014.1008

Basu, S. (2004). E-government and developing countries: an overview. *International Review of Law, Computers & Technology, 18*(1). https://doi.org/10.1080/13600860410001674779

Beaudry, A., & Pinsonneault, A. (2010). The other side of acceptance: Studying the direct and indirect effects of emotions on information technology use. *MIS Quarterly: Management Information Systems, 34*(4). https://doi.org/10.2307/25750701

Bekenova, L. M., Korvyakov, V. A., & Drapkin, I. M. (2021). Connection of Investment Activity and Digitalization in the Megacities of the Republic of Kaza-

khstan. *Economics: the strategy and practice, 16*(3), 94–105. https://doi.org/10.51176/1997-9967-2021-3-94-105

Bekkers, V., & Homburg, V. (2007). The Myths of E-Government: Looking Beyond the Assumptions of a New and Better Government. *The Information Society.*

Belshaw, D. (2014). *Zen and the Arts of Digital Literacies* (tech. rep.).

Bilbao-Osorio, B., & Rodríguez-Pose, A. (2004). From R and D to innovation and economic growth in the EU. *Growth and Change, 35*(4), 434–455. https://doi.org/10.1111/j.1468-2257.2004.00256.x

Bogatencov, P., Secrieru, G., & Iliuha, N. (2012). Computing infrastructure and services deployment for research community of Moldova. *2012 6th International Conference on Application of Information and Communication Technologies, AICT 2012 - Proceedings.* https://doi.org/10.1109/ICAICT.2012.6398535

Bolderston, A. (2012). Conducting a research interview. *Journal of Medical Imaging and Radiation Sciences, 43*, 66–76. https://doi.org/10.1016/J.JMIR.2011.12.002

Bozkurt, A., & Sharma, C. R. (2020). Education in normal, new normal and next normal: Observations from the past, insights from the present and projections for the future. *Asian Journal of Distance Education, 15*(2). https://doi.org/https://doi.org/10.5281/zenodo.4362664

Bradley, N. (1999). *Sampling for Internet Surveys. An Examination of respondent Selection for Internet Research* (tech. rep. No. 4).

Brant, J. M., Haas-Haseman, M. L., Wei, S. H., Wickham, R., & Ponto, J. (2015). *Understanding and Evaluating Survey Research* (tech. rep.).

Brown, S. A., & Venkatesh, V. (2005). *Model of Adoption of Technology in Households: A Baseline Model Test and Extension Incorporating Household Life Cycle* (tech. rep. No. 3). https://www.jstor.org/stable/25148690

Bryman, A. (2012). Social research methods bryman. *OXFORD University Press.*

Bunke, H., & Riesen, K. (2011). Recent advances in graph-based pattern recognition with applications in document analysis. *Pattern Recognition, 44.* https://doi.org/10.1016/j.patcog.2010.11.015

Burieva, M., Mamadrizoeva, N., Mukimov, K., & Mirzoeva, E. (2022). The role and necessity of agricultural industrialization in the regions of the republic of Tajikistan. *BIO Web of Conferences, 51*, 06003. https://doi.org/10.1051/bioconf/20225106003

Busy, E. P. (2000). Social Access to the Internet. *President and the Fellows of Harvard College and the Massachusetts Institute of Technology, 5*(1), 50–61.

Calderón Gómez, D. (2021). The third digital divide and Bourdieu: Bidirectional conversion of economic, cultural, and social capital to (and from) digital capital

among young people in Madrid. *New Media and Society, 23*(9), 2534–2553. https://doi.org/10.1177/1461444820933252

Calhoun, C. (2004). A world of emergencies: Fear, intervention, and the limits of cosmopolitan order. https://doi.org/10.1111/j.1755-618x.2004.tb00783.x

Caliber. (2023). Minister: Azerbaijan investing in infrastructure to address digital divide. https://caliber.az/en/post/165992/

Capurro, R. (2000). Ethical Challenges of the Information Society in the 21st Century. *The International Information & Library Review, 32*(3-4). https://doi.org/10.1006/iilr.2000.0137

Carveth, R. (2003). The economics of online media. In *Media economics: Theory and practice: Third edition.* https://doi.org/10.4324/9781410609687

Castells, M. (1999). Grassrooting the space of flows. *Urban Geography, 20*(4). https://doi.org/10.2747/0272-3638.20.4.294

Chaligava, N. (2018). *E-Government Implementation In Public Administration Of Georgia* (Doctoral dissertation). Hacettepe University Graduate School of Social Sciences. Ankara.

Chang, A. (2012). Utaut and utaut 2: A review and agenda for future research. *The Winners, 13.* https://doi.org/10.21512/tw.v13i2.656

Chen, C., LeGates, R., Zhao, M., & Fang, C. (2018). The changing rural-urban divide in china's megacities. *Cities, 81.* https://doi.org/10.1016/j.cities.2018.03.017

Choi, H., & Park, M. J. (2019). Evaluating the Efficiency of Governmental Excellence for Social Progress: Focusing on Low- and Lower-Middle-Income Countries. *Social Indicators Research, 141*(1), 111–130. https://doi.org/10.1007/s11205-018-1835-1

Colesca, S. E., & Dobrica, L. (2008). *Adoption and use of E-Government services: The case of Romania* (tech. rep.). www.e-guvernare.ro

Colley, A., & Maltby, J. (2008). Impact of the Internet on our lives: Male and female personal perspectives. *Computers in Human Behavior, 24*(5), 2005–2013. https://doi.org/10.1016/j.chb.2007.09.002

Contreras, F., Soria-Barreto, K., & Zuniga-Jara, S. (2022). Managerial support and innovative work behaviour in B corps: Examining the effect of female employee work engagement and corporate reputation. *Journal of Sustainable Finance and Investment, 12*(3), 809–831. https://doi.org/10.1080/20430795.2021.2017255

Czaja, S. J., Charness, N., Fisk, A. D., Hertzog, C., Nair, S. N., Rogers, W. A., & Sharit, J. (2006). *Factors Predicting the Use of Technology: Findings From the Center for Research and Education on Aging and Technology Enhancement (CREATE)* (tech. rep. No. 2).

Dabrowski, M. (2022). Thirty years of economic transition in the former Soviet Union: Macroeconomic dimension. *Russian Journal of Economics*, *8*(2), 95–121. https://doi.org/10.32609/j.ruje.8.90947

Dahlberg, L. (2015). Expanding digital divides research: A critical political economy of social media. *Communication Review*, *18*. https://doi.org/10.1080/10714421.2015.1085777

Danto, E. A. (2008). *Historical Research.*

Davis, F. (1987). *User Acceptance of Information Systems: The Technology Acceptance Model (TAM)*, University of Michigan.

Davis, F. D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, *38*(3), 475–487. https://doi.org/10.1006/imms.1993.1022

Dearnley, C. (2005). A reflection on the use of semi-structured interviews. *Nurse Researcher*, *13*(1). https://doi.org/10.7748/nr2005.07.13.1.19.c5997

DeHaan, J. (2004). A Multifaceted Dynamic Model of the Digital Divide. *IT & Society*, *1*(7).

Delegation of the European Union to Ukraine. (2023). EU starts the largest support-project of Ukraine's digital transformation with a total budget of 17,4 million EUR. https://shorturl.at/fj259

Deng, J., Hua, J., Gyamfi, B. A., & Shaw, R. (2022). *Drones activity in epidemic prevention and prospects in the post-covid-19.* https://doi.org/10.1007/978-981-16-6959-0_3

Denzin, N. K. (2007). Triangulation. In *The blackwell encyclopedia of sociology.* John Wiley & Sons, Ltd. https://doi.org/10.1002/9781405165518.wbeost050

Devine, F., & Heath, S. (1999). *Sociological research methods in context.* Bloomsbury Publishing.

Dierckx de Casterle, B., Gastmans, C., Bryon, E., & Denier, Y. (2012). QUAGOL: A guide for qualitative data analysis. *International Journal of Nursing Studies*, *49*(3), 360–371. https://doi.org/10.1016/j.ijnurstu.2011.09.012

Dimaggio, P., & Hargittai, E. (2001). *From the 'Digital Divide' to 'Digital Inequality': Studying Internet Use As Penetration Increases** (tech. rep.).

Drever, E. (1995). *Using Semi-Structured Interviews in Small-Scale Research. A Teacher's Guide.* Scottish Council for Research in Education.

Dutton, W. H. (2004). Social transformation in an information society: Rethinking access to you and the world. *Organization*, *11*.

EC. (2019). *Key Competences For Lifelong Learning* (tech. rep.). European Union. https://doi.org/10.2766/291008

EC. (2021). *Twinning Project: Support to Digitalisation Agenda in Kyrgyzstan* (tech. rep.). https://international-partnerships.ec.europa.eu/system/files/2022-01/mip-2021-c2021-8987-kyrgyz-republic-annex__en.pdf

EC. (2022a). *Digital Economy and Society Index (DESI) 2022 Latvia* (tech. rep.).

EC. (2022b). *Digital Economy and Society Index (DESI) 2022 Lithuania* (tech. rep.).

EC. (2022c). *Digital Economy and Society Index (DESI) 2022: Thematic chapters* (tech. rep.).

Edwards-Jones, A. (2014). Qualitative data analysis with nvivo. *Journal of Education for Teaching, 40.* https://doi.org/10.1080/02607476.2013.866724

E-Gov Development Center. (2020). *Rqmsal savadlılıq il bağlı sorğu nticlri. [Survey results on digital literacy]* (tech. rep.). Ministry of Digital Development and Transport of the Republic of Azerbaijan. https://www.digital.gov.az/digitalazerbaijan/en/surveys/9/reqemsal-savadliliq-ile-bagli-sorgu-neticeleri

eGovernance Agency. (2023). The Digital Transformation of the Republic of Moldova will be achieved in the next 7 years, based on a unified strategic vision consulted with all stakeholders.

Elena-Bucea, A., Cruz-Jesus, F., Oliveira, T., & Coelho, P. S. (2021). Assessing the Role of Age, Education, Gender and Income on the Digital Divide: Evidence for the European Union. *Information Systems Frontiers*, *23*(4), 1007–1021. https://doi.org/10.1007/s10796-020-10012-9

E-Qanun. (2003). On the approval of the National Strategy for Information and Communication Technologies (2003-2012) for the Development of the Republic of Azerbaijan. https://e-qanun.az/framework/1969

E-Qanun. (2004). About the establishment of the Ministry of Communication and Information Technologies of the Republic of Azerbaijan. https://e-qanun.az/framework/4848

E-Qanun. (2010). State standards of general education in the republic of azerbaijan. https://e-qanun.az/framework/19682#_edn2

E-Qanun. (2012). Establishment of the state agency for service to citizens and social innovations under the president of the republic of azerbaijan and improvement of services provided to citizens by state bodies. https://e-qanun.az/framework/23926

E-Qanun. (2021). About the development of the concept of "Smart City" and "Smart Village". https://e-qanun.az/framework/47263

E-Qanun. (2022). On the approval of the "State Program for the Great Return to the territories freed from occupation of the Republic of Azerbaijan". https://e-qanun.az/framework/52757

Erdenebold, T., Kim, S.-K., Rho, J.-J., & Hwang, Y.-M. (2020). The Effects of Censorship and Organisational Support on the Use of Social Media for Public

Organizations in Mongolia. *The Institute of Management and Economy Research*, *11*(2), 61–79. https://doi.org/10.32599/apjb.11.2.202006.61

Ergunova, O., Skuratov, A., Pozdeeva, O., & Kindaev, A. Y. (2019). Opportunities and emerging trends for digitalization of Russian economy. *IOP Conference Series: Materials Science and Engineering*, *483*(1). https://doi.org/10.1088/1757-899X/483/1/012115

Erlingsson, C., & Brysiewicz, P. (2017). A hands-on guide to doing content analysis. *African Journal of Emergency Medicine*, *7*. https://doi.org/10.1016/j.afjem.2017.08.001

EU. (2015). Briefing bridging the digital divide in the eu. *European Union*.

Federal State Statistics Service. (2022). Distribution of the population who are active users of the Internet, by type of settlement and gender and age groups. https://eng.rosstat.gov.ru/

Federal State Statistics Service. (2023). Percentage of the population that used the Internet to obtain state and municipal services, by type of service and received. https://eng.rosstat.gov.ru/

Fernández-Prados, J. S., Lozano-Díaz, A., & Ainz-Galende, A. (2021). Measuring digital citizenship: A comparative analysis. https://doi.org/10.3390/informatics8010018

Foundation, E. T. (2021). *Digital skills and online learning in azerbaijan. digital factsheet 2020*. European Union. www.e-derslik.edu.az/portal/index.

Frąckiewicz, M. (2023). Satellite internet in azerbaijan. *TS2 Space*. https://ts2.space/en/satellite-internet-in-azerbaijan/

Frappi, C. (2021). Azerbaijan 2021: Towards a new beginning? *Asia Maior*, *32*.

Freedom House. (2022). Freedom on the Net 2022 - Azerbaijan. https://freedomhouse.org/country/azerbaijan/freedom-net/2022

Garnett, P., Johnson, D., & Divakova, I. (2021). *Armenia: Digital Data, Resilience and Policy Assessment Connect2Recover* (tech. rep.).

Gerring, J. (2012). *Social Science Methodology: A Unified Framework* (2nd ed.). Cambridge University Press.

Gilster, P. (1997). *Digital Literacy*. John Wiley & Sons, Inc.

Goede, M. (2019). E-Estonia: The e-government cases of Estonia, Singapore, and Curaao. *Archives of Business Research*, *7*(2). https://doi.org/10.14738/abr.72.6174

Golafshani, N. (2003). *Understanding Reliability and Validity in Qualitative Research* (tech. rep.). http://www.nova.edu/ssss/QR/QR8-4/golafshani.pdf

Goundar, S. (2012). Research Methodology and Research Method. In *Cloud computing*. https://www.researchgate.net/publication/333015026

Grafström, A., & Schelin, L. (2014). How to Select Representative Samples. *Scandinavian Journal of Statistics*, *41*(2), 277–290. https://doi.org/10.1111/sjos.12016

Graham, M. (2011). Time machines and virtual portals: The spatialities of the digital divide. *Progress in Development Studies*, *11*(3), 211–227. https://doi.org/10.1177/146499341001100303

Grecu, M., Costa, I., & Reaboi, A. (2017). *E-government services in Moldova: Value and opportunities.* (tech. rep.).

Grecu, M., & Dicusar, I. (2021). The influence of the economic gap on the level of e-government in developing countries: Republic of Moldova. *Pro Publico Bono - Magyar Közigazgatás*, *9*(1), 16–29. https://doi.org/10.32575/ppb.2021.1.2

Gunkel, D. J. (2003). Second thoughts: Toward a critique of the digital divide. https://doi.org/10.1177/146144480354003

Guseynov, S., Abdullaev, R., Mehdiyev, T., & Edelkina, A. (2021). Information & Communication Technologies (ICT) and Economic Development of the Azerbaijan Republic. *Journal of World economy: Transformations & transitions.* https://doi.org/10.52459/jowett3110103

Hajiyeva, L. (2021). The prospects and problems of e-commerce in Azerbaijan in the context of globalization. *SHS Web of Conferences*, *92*, 06010. https://doi.org/10.1051/shsconf/20219206010

Hampton, K. N., Sessions, L. F., Her, E. J., & Rainie, L. (2009). *Social isolation and new technology: How the internet and mobile phones impact americans' social networks.* Pew Internet Personal Networks and Community.

Hannah, M. (2021). Free Flow versus Fair Flow: Revisiting the New World Information and Communication Order debates in the global era. *Journalism*, *22*(1), 248–264. https://doi.org/10.1177/1464884918773553

Hargittai, E. (2010). Digital Na(t)ives? Variation in internet skills and uses among members of the "net Generation". *Sociological Inquiry*, *80*(1), 92–113. https://doi.org/10.1111/j.1475-682X.2009.00317.x

Heale, R., & Forbes, D. (2013). Understanding triangulation in research. https://doi.org/10.1136/eb-2013-101494

Heeks, R. (2002). Information Systems and Developing Countries: Failure, Success, and Local Improvisations. *The Information Society*, *18*, 101–112. https://doi.org/10.1080/0197224029007503

Helbig, N., Gil-García, J. R., & Ferro, E. (2009). Understanding the complexity of electronic government: Implications from the digital divide literature. *Government Information Quarterly*, *26*(1), 89–97. https://doi.org/10.1016/j.giq.2008.05.004

Hilbert, M., & Katz, J. (2003). *Building an Information Society: a Latin American and Caribbean Perspective* (tech. rep.). Economic Commission for Latin America and the Caribbean. Santiago.

Hinton, D., Kumar, A., Levin, B., Modi, K., Neville-Bonilla, A., O'rourke, S., Strickling, L., & Wilkins, J. (2022). *Are states ready to close the US digital divide?* (Tech. rep.).

Howcroft, D., Mitev, N., & Wilson, M. (2004). *What we may learn from the social shaping of technology approach.*

Hung, C.-L. (2004). *The political economy of the digital divide in Taiwan* (Doctoral dissertation). The Pennsylvania State University.

Ibrahimov, F., Abdurahmanova, G., & Garayeva, G. (2023). Interpretation of the characteristics of the elements of the "assessment of student achievements" block of the informatics subject curriculum applied in general education schools of azerbaijan based on the "system structure" approach. *Pedagogical Sciences*, *106.* https://doi.org/10.5281/zenodo.7607409

Ionan, V. (2022). Digital Transformation in Ukraine: Before, During, and After the War. https://www.sir.advancedleadership.harvard.edu/articles/digital-transformation-in-ukraine-before-during-after-war

Ishkanian, A. (2009). (Re)claiming the emancipatory potential of civil society: a critical examination of civil society and democracy building programs in Armenia since 1991. *The London School of Economics and Political Science*, *51*(1-4), 9–34.

Isman, A., & Gungoren, O. C. (2013). Being Digital Citizen. *Procedia - Social and Behavioral Sciences*, *106*, 551–556. https://doi.org/10.1016/j.sbspro.2013.12.063

ITU. (n.d.). Individuals using the Internet (% of population) - Armenia, Estonia. https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=AM-EE

ITU. (2017). *Measuring the Information Society Report 2017 Volume 2. ICT country profiles* (tech. rep.).

ITU. (2020). The state of broadband 2020: Tackling digital inequalities a decade of action.

ITU. (2021). *Georgia: Digital Development Country Profile* (tech. rep.).

Jenkins, H., Clinton, K., Purushotma, R., Robison, A. J., & Weigel, M. (n.d.). *Confronting the Challenges of Participatory Culture: Media Education for the 21 st Century* (tech. rep.). www.macfound.org.

Jermalavičius, T., & Marmei, E. (2018). The Baltic Region. *Whitehall Papers*, *93*(1). https://doi.org/10.1080/02681307.2018.1508959

Kamenets, A. (2020). *Industrial internet of things and its application in Belarus*, Brest State Technical University. https://www.connectioncafe.com/a-quick-

Kemp, S. (2023a). Digital 2023: Armenia. https://datareportal.com/reports/digital-2023-armenia

Kemp, S. (2023b). Digital 2023: Azerbaijan. https://datareportal.com/reports/digital-2023-azerbaijan

Kemp, S. (2023c). Digital 2023: Turkmenistan. https://datareportal.com/reports/digital-2023-turkmenistan

Kemp, S. (2023d). Digital 2023: Ukraine. https://datareportal.com/reports/digital-2023-ukraine

Kerr, W., & Khatiwada, S. (2021). Using Technology to Improve Civil Service Talent. *Asian Development Bank Briefs*, *176*. https://doi.org/10.22617/BRF210102-2

Knox, C., & Janenova, S. (2019). The e-government paradox in post-soviet countries. *International Journal of Public Sector Management*, *32*. https://doi.org/10.1108/IJPSM-08-2018-0173

Ko, A., Leitner, C., Leitold, H., & Prosser, A. (2013). Technology-Enabled Innovation for Democracy, Government and Governance. *Second Joint International Conference on Electronic Government and the Information Systems Perspective, and Electronic Democracy*. https://doi.org/10.1007/978-3-642-40160-2

Kohut, A., Keeter, S., Doherty, C., Dimock, M., & Christian, L. (2012). *Assessing the Representativeness of Public Opinion Surveys FOR FURTHER INFORMATION CONTACT: 058 PX* (tech. rep.). www.peoplepress.org

Koul, S., & Eydgahi, A. (2017). A systematic review of technology adoption frameworks and their applications. *Journal of Technology Management & Innovation*, *12*(4).

Kravchenko, N. A., Khalimova, S. R., & Ivanova, A. I. (2021). Regional Factors in the Development of the ICT Sector in Russia. *Regional Research of Russia*, *11*(1). https://doi.org/10.1134/S2079970521010081

Krosnick, J. A. (1999). *SURVEY RESEARCH* (tech. rep.). www.annualreviews.org

Kshetri, N. (2018). Blockchain's roles in meeting key supply chain management objectives. *International Journal of Information Management*, *39*, 80–89. https://doi.org/10.1016/j.ijinfomgt.2017.12.005

Kuldosheva, G. (2021). *Challenges and opportunities of digital transformation in the public sector in transition economies: Examination of the case of Uzbekistan.*, Asian Development Bank Institute. https://www.adb.org/publications/challenges-opportunities-digital-transformation-uzbekistan

Kvale, S. (1988). The 1000-Page Question. *Phenomenology + Pedagogy*, *6*(2).

Lee, J., Kim, H. J., & Ahn, M. J. (2011). The willingness of e-Government service adoption by business users: The role of offline service quality and trust in technology. *Government Information Quarterly*, *28*(2), 222–230. https://doi.org/10.1016/j.giq.2010.07.007

Lee-Geiller, S., & Lee, T. ((2019). Using government websites to enhance democratic E-governance: A conceptual model for evaluation. *Government Information Quarterly*, *36*(2). https://doi.org/10.1016/j.giq.2019.01.003

Leeuw, E. d. (2012). Self-Administered Questionnaires and Standardized Interviews. In *The sage handbook of social research methods*. https://doi.org/10.4135/9781446212165.n18

Li, X., Hess, T. J., & Valacich, J. S. (2008). Why do we trust new technology? A study of initial trust formation with organizational information systems. *Journal of Strategic Information Systems*, *17*(1). https://doi.org/10.1016/j.jsis.2008.01.001

Little, W., & McGivern, R. (2014). Introduction to Sociology -1st Canadian Introduction to Sociology -1st Canadian Edition Edition William Little. *BC Campus*.

Lmahamad, A. (2021). Azerbaijan regional leader in Internet penetration. https://www.azernews.az/nation/186595.html

Madigan, R., Louw, T., Wilbrink, M., Schieben, A., & Merat, N. (2017). What influences the decision to use automated public transport? Using UTAUT to understand public acceptance of automated road transport systems. *Transportation Research Part F: Traffic Psychology and Behaviour*, *50*, 55–64. https://doi.org/10.1016/j.trf.2017.07.007

Makkonen, H., & Olkkonen, R. (2017). Interactive value formation in interorganizational relationships: Dynamic interchange between value co-creation, no-creation, and co-destruction. *Marketing Theory*, *17*(4), 517–535. https://doi.org/10.1177/1470593117699661

Margetts, H., & Naumann, A. (2017). *Government as a Platform: What can Estonia Show the World?*

Marshall, M. N. (1996). *Sampling for qualitative research* (tech. rep. No. 6). https://academic.oup.com/fampra/article/13/6/522/496701

Martin, A., & Grudziecki, J. (2006). DigEuLit: Concepts and Tools for Digital Literacy Development. *Innovation in Teaching and Learning in Information and Computer Sciences*, *5*(4), 249–267. https://doi.org/10.11120/ital.2006.05040249

Mathers, N., Fox, N., & Hunn, A. (2000). Using Interviews in a Research Project. In *Research approaches in primary care* (pp. 113–134). Radcliffe Medical Press/Trent Focus.

Mathrani, A., Sarvesh, T., & Umer, R. (2022). Digital divide framework: online learning in developing countries during the COVID-19 lockdown. *Globalisation, Societies and Education*, *20*(5), 625–640. https://doi.org/10.1080/14767724.2021.1981253

Mayring, P. (2000). *Qualitative Content Analysis* (tech. rep.). http://www.zuma-mannheim.de/research/en/methods/textanalysis/

McNamee, J. S. (1982). Review. life chances: Approaches to social and political theory. by ralf dahrendorf. *American Journal of Sociology, 87,* 072–975. https://www.jstor.org/stable/2778794

McTavish, D. G., & Pirro, E. B. (1990). Contextual content analysis. *Quality and Quantity, 24*(3). https://doi.org/10.1007/BF00139259

Microsoft. (2020). Azerbaijani Ministry of Education unlocks the power of data-driven education. https://customers.microsoft.com/en-us/story/862925-ministry-of-education-of-the-republic-of-azerbaijan-government-azure-en-azerbaijan

Middleton, K. L., & Chambers, V. (2010). Approaching digital equity: Is wifi the new leveler? *Information Technology & People, 23*(1). https://doi.org/10.1108/09593841011022528

Mole, R. C. (2012). *The baltic states from the soviet union to the european union identity, discourse and power in the post-communist transition of estonia, latvia and lithuania.* https://doi.org/10.4324/9780203121498

Moon, M. J. (2002). The evolution of E-government among municipalities: Rhetoric or reality? *Public Administration Review, 62*(4), 424–433. https://doi.org/10.1111/0033-3352.00196

Moon, M. D. (2019). Triangulation: A Method to Increase Validity, Reliability, and Legitimation in Clinical Research. *Journal of Emergency Nursing, 45*(1). https://doi.org/10.1016/j.jen.2018.11.004

Moreno-Enguix, M. D. R., Lorente-Bayona, L. V., & Gras-Gil, E. (2019). Can E-government serve as a tool for public authorities to manage public resources more efficiently? *Journal of Global Information Management, 27*(2). https://doi.org/10.4018/JGIM.2019040107

Morse, J. (1991). Approaches to Qualitative-Quantitative Methodological Triangulation. *Nursing Research, 40*(2), 120–123.

MSE. (n.d.). "the digital skills" project. *Ministry of Science and Education of the Republic of Azerbaijan.* https://edu.gov.az/en/programmes/reqemsal-bacariqlar_16387

Musayev, T. (2022). When will uninterrupted internet be available? https://modern.az/olke/377393/nazirin-kesintisiz-internet-vedi-niye-gerceklesmir/

Mussagulova, A. (2021). Newly independent, path dependent: The impact of the Soviet past on innovation in post-Soviet states. *Asia Pacific Journal of Public Administration, 43*(2), 87–105. https://doi.org/10.1080/23276665.2020.1805338

Mutsvairo, B., & Ragnedda, M. (2019). Mapping the digital divide in Africa- A mediated analysis. *Amsterdam University Press.*

Nahmadova, F. (2021). Internet Censorship: Access, Use, and Restriction in Azerbaijan. https://bakuresearchinstitute.org/en/internet-censorship-access-use-and-restriction-in-azerbaijan/

Nam, T. (2014). Determining the type of e-government use. *Government Information Quarterly*, *31*(2), 211–220. https://doi.org/10.1016/j.giq.2013.09.006

Nazarov, S., & Jumayev, B. (2021). Introducing innovative educational technologies into the undergraduate curricula to promote individual work of students: Case of Turkmenistan. *ACM International Conference Proceeding Series*, 182–186. https://doi.org/10.1145/3472410.3472428

Nazarov, S., & Jumayev, B. (2022). *Project-based Laboratory Assignments to Support Digital Transformation of Education in Turkmenistan* (tech. rep. No. 1). https://www.arduino.cc/en/guide/introduction

Nieminen, H. (2016). Digital divide and beyond: What do we know of Information and Communications Technology's long-term social effects? Some uncomfortable questions. *European Journal of Communication*, *31*(1), 19–32. https://doi.org/10.1177/0267323115614198

Nistor, N., Göğüş, A., & Lerche, T. (2013). Educational technology acceptance across national and professional cultures: A European study. https://doi.org/10.1007/s11423-013-9292-7

Noce, A. A., & McKeown, L. (2008). A new benchmark for Internet use: A logistic modeling of factors influencing Internet use in Canada, 2005. *Government Information Quarterly*, *25*(3), 462–476. https://doi.org/10.1016/j.giq.2007.04.006

Nolin, J. M. (2020). Data as oil, infrastructure or asset? Three metaphors of data as economic value. *Journal of Information, Communication and Ethics in Society*, *18*(1), 54–69. https://doi.org/10.1108/JICES-04-2019-0044

O'Brien, S., & Ó Fathaigh, M. (2005). Bringing in Bourdieu's theory of social capital: Renewing learning partnership approaches to social inclusion. *Irish Educational Studies*, *24*(1). https://doi.org/10.1080/03323310500184509

OECD. (2001). *Understanding the digital divide.*

OECD. (2021). *Going digital in latvia.* https://doi.org/10.1787/8eec1828-en

O'Reilly, T. (2010). Government as a Platform. *Innovations*, *6*(1).

Osman, I. H., & Zablith, F. (2021). Re-evaluating electronic government development index to monitor the transformation toward achieving sustainable development goals. *Journal of Business Research*, *131*, 426–440. https://doi.org/10.1016/j.jbusres.2020.10.027

Othman, M. H., Razali, R., & Nasrudin, M. F. (2020). Key Factors for E-Government towards Sustainable Development Goals. *International Journal of Advanced*

Science and Technology, 29(6s), 2864–2876. https://www.researchgate.net/publication/341509023

Paide, K., Pappel, I., Draheim, D., & Vainsalu, H. (2018). On the systematic exploitation of the estonian data exchange layer x-road for strengthening public-private partnerships. *ACM International Conference Proceeding Series.* https://doi.org/10.1145/3209415.3209441

Patton, M. Q. (1990). *Qualitative evaluation and research methods, 2nd ed.* Sage Publications, Inc.

Pearce, K. E., & Kendzior, S. (2012). Networked Authoritarianism and Social Media in Azerbaijan. *Journal of Communication, 62*(2), 283–298. https://doi.org/10.1111/j.1460-2466.2012.01633.x

Petrenko, E. S., & Shevyakova, A. L. (2019). Features and perspectives of digitization in Kazakhstan. In *Studies in computational intelligence* (pp. 889–899). Springer Verlag. https://doi.org/10.1007/978-3-030-13397-9{_}91

Petrosyan, A. (2023). Internet usage rate worldwide as of 2022, by gender and market maturity. https://www.statista.com/statistics/333871/gender-distribution-of-internet-users-worldwide-by-market-maturity/

Petrova-Antonova, D., & Ilieva, S. (2019). Methodological framework for digital transition and performance assessment of smart cities. *2019 4th International Conference on Smart and Sustainable Technologies, SpliTech 2019.* https://doi.org/10.23919/SpliTech.2019.8783170

Peyrouse, S. (2015). *Turkmenistan: Strategies of Power, Dilemmas of Development.* Routledge.

Press Service of the President. (2023). Ilham Aliyev inaugurated the Salyan Digital Management Center of "Azerisiq" ASC. https://report.az/en/domestic-politics/president-ilham-aliyev-inaugurated-salyan-digital-management-center-owned-by-azerishig-ojsc/

Puja Nugraha, Y. M., & Dwi Susanto, T. (2022). Factors Influencing Government Employees to Adopt E-Government Innovation: Systematic Literature Review. *2022 International Seminar on Application for Technology of Information and Communication: Technology 4.0 for Smart Ecosystem: A New Way of Doing Digital Business, iSemantic 2022,* 249–256. https://doi.org/10.1109/iSemantic55962.2022.9920391

Ragnedda, M. (2018). Conceptualizing digital capital. *Telematics and Informatics, 35*(8), 2366–2375. https://doi.org/10.1016/j.tele.2018.10.006

Ragnedda, M., & Muschert, G. W. (2013). *The digital divide: The internet and social inequality in international perspective.* https://doi.org/10.4324/9780203069769

Ranchordás, S. (2020). *The Digitalization of Government and Digital Exclusion: Setting the Scene* (tech. rep.).

Reglitz, M. (2020). The Human Right to Free Internet Access. *Journal of Applied Philosophy*, *37*(2), 314–331. https://doi.org/10.1111/japp.12395

Reiter, C. (2017). *Theory and methodology of exploratory social science research* (tech. rep. No. 4). www.ijsrm.humanjournals.com

Reyaz, M. (2020). Cyberspace in the Post-Soviet States: Assessing the Role of New Media in Central Asia. *Jadavpur Journal of International Relations*, *24*(1), 7–27. https://doi.org/10.1177/0973598419875266

Roberts, M. E. (2020). Resilience to Online Censorship. https://doi.org/10.1146/annurev-polisci-050718

Roshanaei, M., & Duan, Q. (2021). International Telecommunication Union Standardization for Trust Provisioning in Information, Communication and Technology Infrastructure toward Achieving United Nation's Sustainable Development Goals. *Journal of Computer and Communications*, *09*(10), 44–59. https://doi.org/10.4236/jcc.2021.910004

Schleife, K. (2010). What really matters: Regional versus individual determinants of the digital divide in Germany. *Research Policy*, *39*(1). https://doi.org/10.1016/j.respol.2009.11.003

Schneckenberg, D. (2009). Understanding the real barriers to technology-enhanced innovation in higher education. *Educational Research*, *51*(4), 411–424. https://doi.org/10.1080/00131880903354741

Sheryazdanova, G., Nurtazina, R., Byulegenova, B., & Rystina, I. (2020). Correlation between e-government and corruption risks in kazakhstan. *Utopia y Praxis Latinoamericana*, *25*(Extra 7), 41–48. https://doi.org/10.5281/zenodo.4009592

Shin, S.-C., Ho, J.-W., & Pak, V. Y. (2020). Digital Transformation through e-Government Innovation in Uzbekistan. *International Conference on Advanced Communications Technology(ICACT)*, 632–639.

Siegelbaum, L. (n.d.). Baltic Independence. https://soviethistory.msu.edu/1991-2/baltic-independence/

Soltobaev, A. (2020). *Digital skills and opportunities for youth employment towards digital economy in the Kyrgyz Republic* (tech. rep.). United Nations Development Programme.

Solutions, B. (2018). Azerbaijan has become the first country to implement the prototype of estonian x-road platform in e-government system. https://bestsolutions.ee/2018/03/azerbaijan-has-become-the-first-country-to-implement-the-prototype-of-estonian-x-road-platform-in-e-government-system/

Sousa, H. (2019). Digital Media Inequalities: Policies Against Divides, Distrust and Discrimination. *European Journal of Communication, 34*(6). https://doi.org/10.1177/0267323119886749

Sparks, C. (2013). What is the "digital divide" and why is it important? *Javnost, 20*(2). https://doi.org/10.1080/13183222.2013.11009113

Stack, M., & Kelly, D. M. (2006). Popular media, education, and resistance. https://doi.org/10.2307/20054144

Staniszewski, M. A. (2000). From Beijing to Manhattan: A Report on the June 2000 Review of the Beijing Fourth World Conference on Women and a Transformation in Human Rights and ICT.

Strauss, A., & Corbin, J. M. (1997). *Grounded Theory in Practice.* Sage.

TAdviser. (2023). IT market of Russia. https://tadviser.com/index.php/Article:IT_market_of_Russia

Tan, P. J. B. (2013). Applying the UTAUT to understand factors affecting the use of english e-learning websites in Taiwan. *SAGE Open, 3*(4). https://doi.org/10.1177/2158244013503837

Thawar, A. (2008). *E-Government and the Digital Divide*, Applied Science University.

Transparency International. (2023). Corruption Perceptions Index 2022. https://www.transparency.org/en/cpi/2022

Traşca, D. L., Ştefan, G. M., Sahlian, D. N., Hoinaru, R., & Şerban-Oprescu, G. L. (2019). Digitalization and business activity. The struggle to Catch Up in CEE countries. *Sustainability (Switzerland), 11*(8). https://doi.org/10.3390/su11082204

Turdiev, A. S., Kakhramonov, K. S. u., & Yusupdjanova, N. U. (2020). Digital Economy: Experience Of Foreign Countries and Foreign Of Development In Uzbekistan. *Theoretical & Applied Science, 84*(04), 660–664. https://doi.org/10.15863/TAS.2020.04.84.112

UN. (2022). *Operationalizing leaving no one behind.* United Nations Sustainable Development Group 2022.

UN. (2023). Bridge Digital Divide within Decade to Ensure All Have Meaningful Access, Secretary-General Tells World Internet of Things Conference. https://press.un.org/en/2023/sgsm21682.doc.htm

UN & Government of Azerbaijan. (2020). *Sustainable Development Cooperation Framework (UNSDCF) 2021-2025* (tech. rep.).

UN DESA. (n.d.). Kazakhstan - United Nations E-Government Knowledgebase. https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/87-Kazakhstan/dataYear/2022

UN DESA. (2022). *E-Government Survey 2022: The Future of Digital Government* (tech. rep.). https://publicadministration.un.org/en/

UNDP. (2022). *Digital strategy 2022-2025*. United Nations.

UNESCO. (2005). *Towards Knowledge Societies* (tech. rep.). UNESCO Publishing. Paris.

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences, 15.* https://doi.org/10.1111/nhs.12048

Valente, T. W., & Rogers, E. M. (1995). The Origins and Development of the Diffusion of Innovations Paradigm as an Example of Scientific Growth. *Science Communication, 16*(3). https://doi.org/10.1177/1075547095016003002

Valiyev, A., Akhundov, B., Mukhtarova, G., & Ismayilova, N. (2022). Localizing Smart Urban Development in Azerbaijan. *ETH Zurich.* https://doi.org/10.3929/ethz-b-000525828

Valiyev, A., Babayev, A., Huseynova, H., & Jafarova, K. (2017). Do citizens of the former Soviet Union trust state institutions and why: The case of Azerbaijan. *Communist and Post-Communist Studies, 50*(3), 221–231. https://doi.org/10.1016/j.postcomstud.2017.08.002

Valiyev, A., & Valehli, F. (2022). COVID-19 and Azerbaijan: Is the System Resilient Enough to Withstand the Perfect Storm? *Problems of Post-Communism, 69*(1). https://doi.org/10.1080/10758216.2021.1920840

van Der Heijden, H. (2004). *User Acceptance of Hedonic Information Systems* (tech. rep. No. 4). https://www.jstor.org/stable/25148660?seq=1&cid=pdf-

van Deursen, A., & Helsper, E. (2015). The Third-Level Digital Divide: Who Benefits Most from Being Online? https://doi.org/10.1108/s2050-206020150000010002

van Deursen, A., Helsper, E., Eynon, R., & van Dijk, J. (2017). The compoundness and sequentiality of digital inequality. *International Journal of Communication, 11*, 452–473. http://ijoc.org.

van Deursen, A., & van Dijk, J. (2011). Internet skills and the digital divide. *New Media and Society, 13*(6), 893–911. https://doi.org/10.1177/1461444810386774

van Deursen, A., & van Dijk, J. (2014). The digital divide shifts to differences in usage. *New Media and Society, 16*(3), 507–526. https://doi.org/10.1177/1461444813487959

van Dijk, J. (2005). *The deepening divide: Inequality in the information society.* https://doi.org/10.4135/9781452229812

van Dijk, J. (2006). Digital divide research, achievements and shortcomings. *Poetics, 34*(4-5), 221–235. https://doi.org/10.1016/j.poetic.2006.05.004

van Dijk, J. (2013). A theory of the digital divide. In *The digital divide: The internet and social inequality in international perspective.* https://doi.org/10.4324/9780203069769

van Dijk, J. (2020). *The digital divide.* John Wiley & Sons.

van Dijk, J., & Hacker, K. (2003). The Digital Divide as a Complex and Dynamic Phenomenon. https://doi.org/10.1080/01972240309487

Vannoy, S. A., & Palvia, P. (2010). The social influence model of technology adoption. *Communications of the ACM*, *53*(6), 149–153. https://doi.org/10.1145/1743546.1743585

van Thiel, S. (2014). *Research methods in public administration and public management: an introduction.* Abingdon: Routledge.

Varpio, L., Paradis, E., Uijtdehaage, S., & Young, M. (2020). The Distinctions Between Theory, Theoretical Framework, and Conceptual Framework. https://doi.org/10.1097/ACM.0000000000003075

Vartanova, E., & Gladkova, A. (2019). New forms of the digital divide. In J. Trappel (Ed.), *Digital media inequalities: Policies against divides, distrust and discrimination* (pp. 193–213). Göteborg: Nordicom.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). *User Acceptance of Information Technology: Toward a Unified View* (tech. rep. No. 3).

Viktorovna, V. O. (2016). Dynamics of the digital inequality in Russia. *Monitoring Obshchestvennogo Mneniya: Ekonomicheskie i Sotsial'nye Peremeny*, *5*(135), 163–182. https://doi.org/10.14515/monitoring.2016.5.10

Virchow, D., & von Braun, J. (2001). *Okinawa charter on global information society.* https://doi.org/10.1007/978-3-642-56575-5_40

Waller, W. T. (1987). Ceremonial Encapsulation and Corporate Cultural Hegemony. *Journal of Economic Issues*, *21*(1), 321–328.

Warschauer, M. (2003). Demystifying the digital divide. *Scientific American*, *289*(2). https://doi.org/10.1038/scientificamerican0803-42

Williams, M., & Moser, T. (2019). The art of coding and thematic exploration in qualitative research. *International Management Review*, *15*.

Williams, R., & Edge, D. (1996). *The social shaping of technology* (tech. rep.). ELSEVIER.

Wolski, U. (2018). The history of the development and propagation of QDA software. *Qualitative Report*, *23*(13), 6–20. https://doi.org/10.46743/2160-3715/2018.2984

World Bank Group. (2016). *World Development Report: Digital Dividents* (tech. rep.). https://doi.org/10.1596/978-1-4648-0671-1

Wu, K., Zhao, Y., Zhu, Q., Tan, X., & Zheng, H. (2011). A meta-analysis of the impact of trust on technology acceptance model: Investigation of moderating influence of subject and context type. *International Journal of Information Management*, *31*(6), 572–581. https://doi.org/10.1016/j.ijinfomgt.2011.03.004

Yin, R. K. (1994). Discovering the Future of the Case Study Method in Evaluation Research. *American Journal of Evaluation*, *15*(3). https://doi.org/10.1177/109821409401500309

Yu, P. K. (2002). Bridging the Digital Divide: Equality in the Information Age. *Cardozo Arts & Entertainment Law*, *20*(1), 1–52. www.digitaldividenetwork.org/content/stories/index.cfm?key=18

Zeynalov, A. (2021). Organizational Citizenship Behaviour in Azerbaijan: The Case of Asan Service in Azerbaijan. *Bulletin of Taras Shevchenko National University of Kyiv. Public Administration*, *14*(2), 10–13. https://doi.org/10.17721/2616-9193.2021/14-2/6

Zhang, Y., & Wildemuth, B. M. (2009). Qualitative analysis of content. *Applications of Social Research Methods to Questions in Information and Library Science.* https://doi.org/10.1002/hbm.20661

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