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IMPLEMENTATION OF ONLINE APPOINTMENT SYSTEM IN PUBLIC HOSPITALS IN THE REPUBLIC OF AZERBAIJAN

Master's thesis

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PATSIENTIDE DIGITAALSE REGISTREERIMISE SÜSTEEMI SISSEVIIMINE AZERBAIJANI VABARIIGI RIIKLIKESSE HAIGLATESSE

Magistritöö

Juhendaja: Riin Ehin

Author’s declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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Abstract

The aim of this thesis is to understand the current situation in the healthcare system in the Republic of Azerbaijan. Identify the obstacles in the way of digitalization in the healthcare sphere. The research also aims to build a strategy for implementing an online appointment system in public hospitals, understand the readiness of citizens for usage of this e-service, and identify the solutions that can help to overcome the existing obstacles.

The foundations of this research are case study approach and interview and survey analysis. In the case study approach author compares Estonia and Azerbaijan and choses Estonian online appointment system in the Patient Portal as an example and possible approach for digitalization of the current appointment system in Azerbaijan. Understanding of the current situation with the help of interviews and a survey helps the author to provide better recommendations for digitalization of the appointment system in the country.

This thesis is written in English and is 50 pages long, including 7 chapters, 10 figures and 8 tables.

Keywords: Azerbaijan, online appointment, Estonian digital registration system, e-services, healthcare system, service digitalisation

Annotatsioon

Käesoleva lõputöö eesmärk on mõista tervishoiusüsteemi praegust olukorda Aserbaidžaani Vabariigis. Tuua välja digiteerimisega seotud takistused tervishoiu valdkonnas. Uurimuse eesmärk on välja töötada strateegia online-broneeringusüsteemi rakendamiseks avalikes haiglates, mõista kodanike valmisolekut selle teenuse kasutamiseks ning leida lahendusi, mis aitaksid ületada olemasolevaid takistusi.

Selle uurimuse aluseks on juhtumiuuringute lähenemine ning intervjuu- ja küsitlusanalüüs. Juhtumiuuringute lähenemises võrdleb autor Eestit ja Aserbaidžaani ning valib näiteks Eesti patsiendiportaalis asuva online-broneerimissüsteemi kui võimaliku lähenemisviisi Aserbaidžaani praeguse broneerimissüsteemi digiteerimiseks. Intervjuude ja küsitluse abil praeguse olukorra mõistmine aitab autoril anda paremaid soovitusi broneerimissüsteemi digitaliseerimiseks Aserbaidžaanis.

Käesolev lõputöö on kirjutatud inglise keeles ja selle maht on 50 lehekülge, sealhulgas 7 peatükki, 10 joonist ja 8 tabelit.

Võtmesõnad: Aserbaidžaan, online-broneering, Eesti digitaalne registreerimissüsteem, e-teenused, tervishoiusüsteem, teenuste digitaliseerimine.

List of abbreviations and terms

E-Governance	Electronic Governance
E-service	Electronic service
ICT	Information and Communication Technology
TAM	Technology Acceptance Model
ID	Identification Document
E-health	Electronic health
IT	Information Technology
GDP	Gross Domestic Product
MTCHT	Ministry of Transport, Communications, and High Technologies

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1. Introduction

Technology has become incredibly important and plays a significant role in our daily lives, and it is affecting almost every aspect of modern society. Technology has improved nearly every aspect of our life, including communication, entertainment, education, as well as healthcare. It has also developed in areas such as politics, economic, and social lives of all people on the planet. Technology is considered a great opportunity because it offers solutions in a variety of fields, makes life easier for people, and creates new possibilities for growth. In healthcare, technology has played a significant role in improving patient care and outcomes. Healthcare is one of the industries that must provide opportunities to improve its service provision through digital technologies. With the help of technology, it is now easier for doctors and healthcare professionals to access and exchange patient data, diagnose illness, and provide treatment remotely. Examples include electronic health records and telemedicine. Several medical applications nowadays help people to manage and track their health and well-being, make appointments, and remind them to take their medication on time. ICT, in general, helps to solve a variety of issues and opens new possibilities for traditional healthcare problems. According to the research on handling healthcare during the COVID-19 pandemic, ICT has been acknowledged as a crucial tool for improving the quality, accessibility, and delivery of healthcare (Goodarzian, Ghasemi, Gunasekaran, Taleizadeh, & Abraham, 2021). It is difficult to imagine a healthcare organization today that fails to take advantage of information technology innovations.

E-Governance is the application of technology to enhance the effectiveness, accountability, and transparency of governmental services. The implementation of e-Government initiatives has the potential to improve the delivery of citizen services and lower corruption. It is important to take into consideration the trust of citizens in the technology that affects the success of e-Governance implementation.

The healthcare sector is an essential aspect of society, and its importance has been highlighted even more so in recent times due to the ongoing pandemic. E-service adoption in the healthcare industry has the ability to establish a higher quality of care, increase access, and reduce costs. The importance of the government implementing e-services in the healthcare sector cannot be overemphasized.

One of the most important spheres in society is the healthcare sector, and the efficient management of hospitals is essential for ensuring the health and well-being of patients. Managing patient appointments is one of the biggest challenges that hospitals face daily. The implementation of an online appointment system in hospitals can streamline the appointment booking process, reduce wait times, improve patient satisfaction, and increase the efficiency of hospital operations.

1.1.Necessity and importance of the topic

Azerbaijan's healthcare business is underdeveloped, with medical education falling short of Western norms and institutions lacking cutting-edge equipment. For health care, lots of citizens are traveling to different countries in order to find good doctors there (Export, Azerbaijan Statistics, 2019). According to Yoon, Minges, & Kwitowski, 2019 to improve service quality, reduce costs, and increase the accessibility of healthcare services, the strategic ICT road plan is aimed for the development of an end-to-end, integrated e-health infrastructure. The Ministry of Health has received financial support from the Ministry of Transport, Communications, and High Technologies (MTCHT) for the development of start-up businesses with a focus on creating medical applications. This goal includes digital prescriptions and unified electronic medical records. However, there are several disadvantages of the current situation:

1. To get an appointment with the doctor, you have to find the contact number of the hospital and wait in line to reach out. Sometimes it takes a lot of time to get an appointment with the doctor, considering that information about other available doctors in this hospital was not provided.
2. Contact and general information on the existing websites may sometimes not be updated or sufficient for the citizens to get their full trust.
3. Not all the required information is available online.
4. There is no single hospital e-service that can combine the database of all hospitals, including information about doctors, information about hospitals (what is the closest hospital for the user, what are the hospitals where the chosen doctor can accept the patient, what are the prices of the service provided, what are the documents needed and etc.), on one joint platform.

5. Citizens do not have the possibility to register and store their personal health-related information in one place; moreover, they don't have the possibility to find the information described above in an easy and convenient way.

Analyzing the levels of the existing system and proposing to the Ministry of Health of the Republic of Azerbaijan a platform where citizens can register, take online appointments, and possibly store prescriptions of the doctor in one place could be one of the steps towards digitalization of the current appointment system in hospitals. The benefits of this study are to help people to understand what the current appointment system structure in the country is and how to move towards digitalization.

2. Theoretical framework

- Doctors' understanding of the importance of service provision digitalization.

Traditional methods of preparing doctors for technology installations sometimes miss chances to include doctors in tasks that would encourage ownership and effective use of the new system (Deloitte Consulting LLP, 2015). The readiness of doctors to adopt digitalization of the service provision will be defined in the interviews conducted for this study.

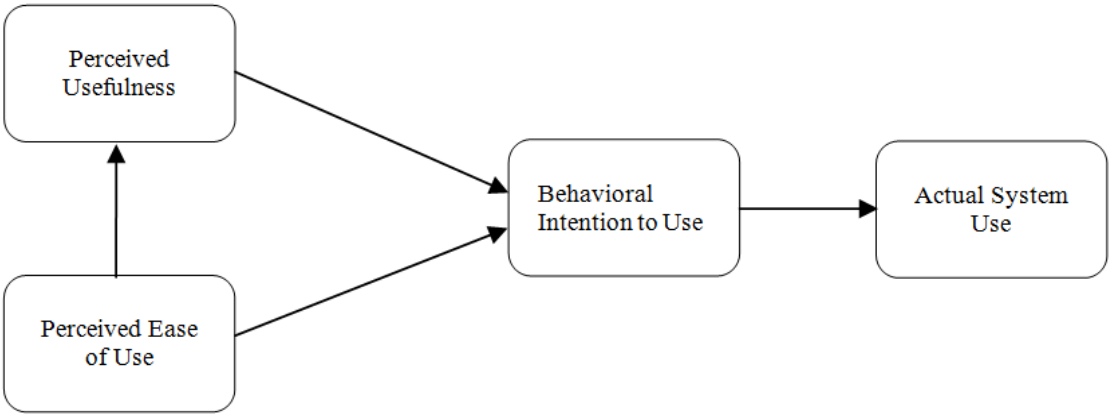
- Healthcare provision should be put on the path leading toward digitalization.

One of the most crucial components of medical equipment is healthcare technology. It helps in raising the effectiveness and quality of treatments (Calman, Kitson, & Hauser, 2007). Additionally, it has an impact on the indirect profit that hospitals add. For instance, providing the possibility to book an appointment online through the platform where you can see your medical records online can reduce the amount of time needed for care processing stages. Healthcare services will become ineffective and lose their credibility with patients if digitalization is not adopted for extra help. Information technology must thus be used in healthcare service provision. One of the key advantages of employing ICT in the healthcare industry is improving the quality of patient assistance. The fragmentation of healthcare, which means the division of healthcare system in many different parts or organizations that do not always communicate well together and the challenges in effectively transferring

information are two of this sector's most significant problems. ICT can increase patient safety by providing direct access to medical case studies, allowing for online treatment reviews, monitoring patient progress, and foreseeing potential medical mistakes. They are viewed as generally beneficial tools by both professionals and users. Another advantage of using ICT in healthcare services is the potential to create new improved healthcare paradigms or models. ICT has been described as a technology with great potential for transformation since it opens up new ways for the practice of medicine and the improvement of healthcare.

The Technology Acceptance Model (TAM), developed by Fred Davis in 1986, is chosen as a foundation for the theoretical framework. TAM was used in many studies that analyzed the adoption of information technology by users (Masrom, 2007).

Figure 1. Technology Acceptance Model

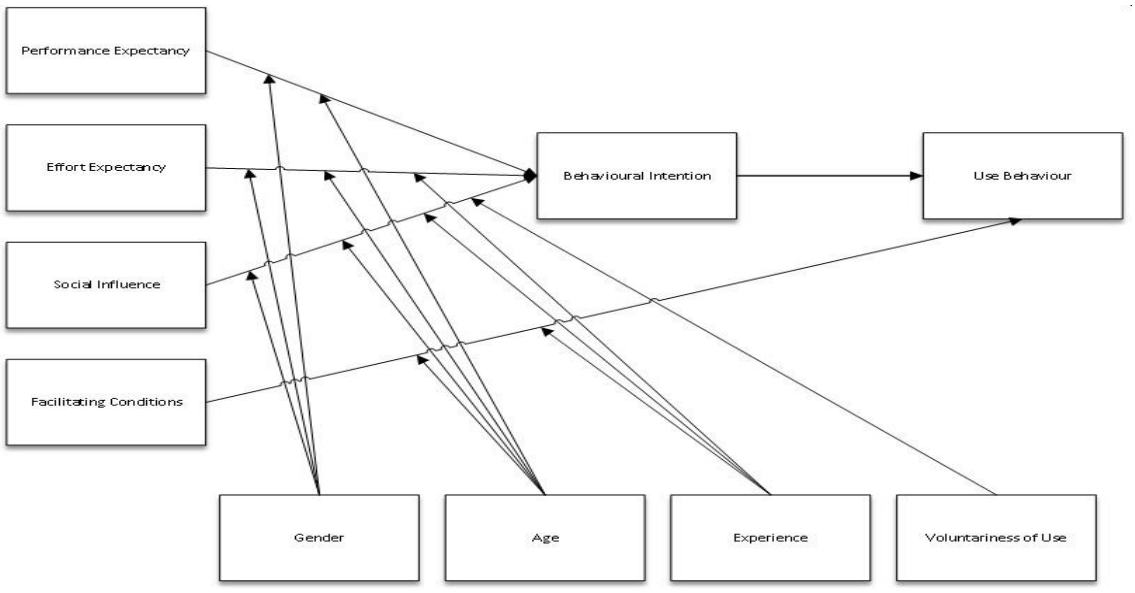


If we take a look at Figure 1, we can see that the Technology Acceptance Model consists of two variables: perceived usefulness and perceived ease of use. For a better understanding of the theory, citizens' use of a possibly adopted online appointment system in the hospitals can be given as an example. If we assume that citizens have digital literacy and skills to easily use technology applied to the new services, in that case, we can say that these citizens would also see all the benefits of the service digitalization, have more trust towards the safety of personal data and understand that the improvement of the service provision can positively affect citizens experience and satisfaction with the service.

The Technology Acceptance Model (TAM), the combined TAM and TPB model (C-TAM-TPB), Innovation Diffusion Theory (IDT), and the model of PC usage (MPCU) were used to describe another acceptance model proposed by Venkatesh, Morris, Davis, & Davis (2003).

In Figure 2, according to this model, the anticipated adoption of technology is dependent on the direct impact of four main constructs, which are *performance expectancy* ("the degree to which an individual believes that using the system will help him or her to attain gains in job performance"), *effort expectancy* ("the degree of ease associated with the use of the system"), *social influence* ("the degree to which an individual perceives that important others believe he or she should use the new system"), and *facilitating conditions* ("the degree to which an individual believes that an organization's and technical infrastructure exists to support the use of the system"). Looking at Figure 2, we also can see how Venkatesh proposed in his study that the strength of predictors on intention is defined by the moderation effects of age, gender, experience, and voluntariness of use (as cited in Marikyan & Papagiannidis, 2021). All four predictors are affected by age. Relationships between effort expectancy, performance expectancy, and social influence are affected by gender. The link between effort expectancy, social influence, and facilitating conditions are moderated by experience. And only voluntariness of use moderates the relationship between social influence and behavioral intention (Venkatesh, Morris, Davis, & Davis, 2003).

Figure 2. The Unified Theory of Acceptance and Use of Technology



The Unified Theory of Acceptance and Use of Technology model can be applied to the current research by examining the four constructs mentioned above and how they are related to the adoption and use of an online appointment system. The first construct shows individuals believe that technology will help them perform their tasks more effectively,

which means that in the case of online appointment system, patients may be more likely to use it if they believe that it will make scheduling appointments easier and more efficient. The second construct shows individuals believe that using technology will not require much effort and will be easy to use, which leads us to the likelihood of patients using online appointment platform if it is going to be simple to navigate. In regard to the third construct, if patients' understanding of the importance of the platform will be influenced by healthcare providers, and doctors, it will lead them to believe that the system is important to use. And in accordance with the last construct, in the case of online appointment system people will be more likely to use it if they believe that the necessary hardware, software as well as organizational support are in place.

2.1.Literature review

Giving information on the research that has already been done in this area is the literature review's principal goal. Azerbaijan and Estonia, two case studies of developing and developed nations, respectively, are covered in the case study approach discussion of the paper.

In recent years, the importance of digitalization of healthcare service provision has significantly improved. A variety of advantages that can improve patient outcomes, increase access to healthcare and reduce the cost are provided by the digitalization of healthcare services. Especially after the first waves of COVID-19, many impacts have been made on sectors around the world, including healthcare (Mas, Massaro, Rippa, & Secundo, 2023).

As Medina-Moreira et al. (2022) stated in their study, a significant contributor to maintaining the high demand for healthcare services during the Covid-19 was the digital transformation of healthcare organizations, which made it possible to establish new channels of communication, payment methods, information processing, and online medical consultation services, among other services. Through a structured, strategic, and cultural change process accompanied by the use of cutting-edge technologies that enable the systematization of processes and proper data analysis, this transformation involves significant changes in people's cultures.

Digital services cover every aspect of our life. As Lolich & Timonen, 2022 specified in their paper, digitalization can provide benefits over traditional services, such as the elimination of delays associated with paper forms and the need for repetitive information submission.

Digital divides can be created across age groups, which can lead to the creation of new administrative categories that are off-putting to service users. Digitalization has an impact on social justice because it can lead to divisions and classifications that are set between those with the necessary skills and knowledge from those who lack these skills and are less adept at navigating the new systems, laws, and obligations that come with it.

One of the key benefits of digitalization in healthcare is improved access to healthcare services. This means that with the help of digitalization, healthcare providers can offer online consultations, telemedicine, and online appointment booking. For most of the patients, it has been easier to get their medical prescriptions online, store their health records, and make appointments to the hospitals faster without even leaving their houses and going to the hospital. Another benefit of digitalization is that doctors can also access their patients' data very fast without spending too much time on it or trying to find information as if it were paper-based.

There are different limitations that can affect the implementation of digitalization in healthcare service provision, where one of them is digital literacy. There can be an assumption that elderly populations with low literacy levels are more likely to continue using traditional ways of keeping their health records on a paper-base and making appointments to the hospital on-site or by phone. However, Wang and Gupta (2011) mentioned in their study these methods may have a negative effect on patient satisfaction because, in this case, employees from the hospital they are talking to sometimes can incorrectly insert appointment date or time or refer patients to the wrong healthcare provider. (as cited by Yang, et al., 2019)

But according to Li et al. (2022), after the study they conducted, they came to the conclusion that during COVID-19, older adults started using a tool for making registration online and were more satisfied with the service in comparison with the traditional way of doing it. This outcome can be achieved by providing some training or free courses to learn the basics of ICT technologies to those who have low digital literacy.

Since citizens are one of the main stakeholders in the improvement of services provided by the government, it is important to understand that the digital literacy of citizens plays a significant role when it comes to the implementation of digitalization in any service. According to the statistics (Statista, 2023), the literacy rate in Azerbaijan between the years 2007 and 2019 is 99.8%. However, we should consider that more than half of the population of Azerbaijan lives in cities other than Baku, where hospitals are not well equipped with ICT technologies, or in some areas, there is no internet access at all.

As Romero, Gaiardelli, Pezzotta, & Cavalieri (2019) specified in their paper, considering that digitalization of the service plays a significant role in the improvement of the service provision process, it is most important to understand the impact it makes on the service characteristic and interaction between service providers and customers. Not only the technological components but also social, political, and organizational components are involved in this process. Although there are several benefits of digitalization of the service provision, according to the survey conducted by Ingaldi & Klimecka-Tatar, 2022, many participants stated that they don't feel secure online and are strongly concerned about losing personal data. These concerns usually arise because of information that people can find about cyber-attacks on different organizations and data theft or loss.

Therefore, during the implementation of the digitalization of service provision, several factors should be taken into consideration:

- citizens' trust
- digital literacy
- secure storage of personal data

3. Research methodology

For writing this thesis, qualitative and quantitative research methods will be used. By using a qualitative and quantitative research methodology, the primary goal of this study is to determine how digitalization might help the service provision in the health sector in Azerbaijan to improve. Possible recommendations will be provided after analyzing the primary data.

The meta research question of the paper is: How can the current appointment system become digitalized in the Republic of Azerbaijan?

Since the procedure of making appointments is made in traditional ways, it is necessary to understand the importance of the digitalization of the service and define its advantages and possible disadvantages. This can be well identified with the help of the following three sub-questions:

- Research Question 1: What are the demands for implementing digitalization of appointment system?

This question will help to determine the demands for the implementation of digitalization of appointment system during the interviews, survey data analysis, and based on the research about the appointment system in Estonia.

- Research Question 2: What are the obstacles for the digitalization of the system?

In order to determine the digitalization path for the service provision, it is important to understand the obstacles that keep the current situation from improving.

- Research Question 3: How to introduce the solution to public hospitals and patients, and how likely will they use it?

During the interviews the doctors will be asked what in their opinion would be essential for the team so that the hospitals where they work would use an online appointment system. This will help to identify the possible solution for the introduction of the service.

- Research Question 4: How can the example in Estonia be applied to the current appointment system in Azerbaijan?

Understanding the current appointment process in the Republic of Azerbaijan will help to understand what is required to be improved in order to apply an example from Estonia.

When approaching the topic, both primary (surveys of citizens) and secondary data (articles and statistics from the Azerbaijani Ministry of Health) will be used. Research tools, including surveys, will be used to assist in answering the research questions. Healthcare service delivery systems in Estonia and Azerbaijan will be compared, and it will be assessed whether the same problem-solving techniques can be applied to address issues in Azerbaijan's public hospitals.

The goals of the quantitative method – the survey will be to understand the readiness of the citizens for the change in the system, to define their current experience and satisfaction level with making appointments to the hospital and identify the obstacles that keep the current process from improving.

With the help of the interviews, the current appointment process in hospitals will be described, and how ready the hospital employees are. It is important to understand what they would recommend considering their experience with the current appointment process.

The research question will be addressed via primary data collection. During the course of the study, three physicians from the public hospitals will be interviewed. The survey will be distributed to about 100 people, but the more citizens who participate, the better we will understand how prepared people are for the change and what, in their opinion, may be improved.

One of the main research objectives of this paper is to identify the readiness of citizens for the digitalization of the service and the importance of improving and implementing ICT technologies in healthcare provision. Another objective is to introduce a possible solution for the digitalization of the appointment system in hospitals based on the example of the appointment system in Estonia. To achieve this objective and to address the research questions of this thesis survey will be conducted for citizens, and interviews will be held with the employees from the public hospitals.

3.1.Ethical considerations

During the research period, the following ethical considerations will be in place:

- Survey and interview confidentiality will be maintained.
- Only with consent and permission will the interviewee's identity and job title be revealed to the public.
- The information gathered from the surveys and interviews will be properly analyzed.

4. Case study approach

4.1.Estonia

Estonian healthcare system is very developed and provides services to citizens on the highest level. A centralized e-health concept was introduced in 2008 with the goal of providing patients and medical professionals with access to all health information. The patient has the right to control who has access to personal information that is not life critical. As was stated in the Estonia Health system review, the e-health system connects to the websites and databases of many actors to build an information-exchange platform. (Habicht, et al., 2018) The healthcare system in Estonia is organized in a way that separates and assigns different functions to different stakeholders. They are identified as:

- The Ministry of Social Affairs and its agencies, responsible for regulation of the healthcare system.
- The Estonian Health Insurance Fund that manages the financing of the healthcare system.
- Private healthcare organizations that operate under their own legal structures.

(Estonian health care system, 2022). There are different IT solutions that primary care doctors and hospitals use in Estonia. The primary healthcare (i.e., family doctors) is in private ownership; they do have agreements with the Health Insurance Fund for covering the costs of their services ordered. So are the hospitals - they are not directly state-owned but owned by state/city foundations or organized as private entities in other business forms. Thus, it gives them a certain amount of liberty to decide upon their IT systems and service providers. As family doctors and hospitals need IT solutions for the input of various healthcare data, the systems the primary healthcare/hospitals use are not the same that are visible for the patients. Primary health care uses Perearst 1, Perearst 2, etc. Hospitals use Ester, arstiportaal, EHL, Elisa etc. In some aspects, it is good that each health-related organization has the possibility to use the IT system suitable for their needs. However, a singular nationwide system that can be used by all doctors can have its benefits. From this point of view, Azerbaijan can learn not only from the success stories of Estonia but also from the issues that might have been solved differently. A national system called the Electronic Health Record (e-Health Record) combines information from all of Estonia's healthcare providers to produce a single record that any patient may view online.

With almost unlimited access to healthcare services from private service providers, the Estonian healthcare system is based on mandatory health insurance and the solidarity

principle. The Estonian Health Insurance Fund provides the majority of the funding for healthcare services. The cost of financing healthcare in 2018 was 6.7% of GDP. According to the research "The Future of Healthcare in Estonia", the public sector contributed 73.7%, patients contributed 24.5%, and the remaining 1.8% came from optional insurance and other sources (Foresight Centre, 2020).

Nowadays doctors have access to a "strong tool," which refers to an electronic health record system e-Patient, that allows them to retrieve a patient's medical details from a single electronic file. This means that doctors don't have to search through multiple paper files or reach out to different hospitals to get information they need.

Moreover, even if a patient is at a distant hospital, doctors can still see their test results as they entered, meaning that the electronic health record system is able to transmit data in real-time, allowing doctors to access it quickly and easily no matter where they are located. (e-Estonia, 2021).

E-health is the practice of using web-enabled tools and techniques to achieve a variety of health-related objectives. These objectives can include:

Enhancing the quality and scope of medical treatment that can be offered, encouraging patients to become more involved in their healthcare and to improve their overall experience of the healthcare system, using technology to make healthcare procedures more efficient, lowering overall healthcare costs (E-Health General Information, 2023).

People can register in the patient portal using their ID cards. This allows you to view your medical data, submit statements and make appointments.

The most essential point to underline is that in Estonia, patient records are digitalized and protected by the Blockchain, which allows medical providers to access patient records from a single source. This positioned Estonia to lead in preventative health, patient self-treatment, and business efficiency, which means that Estonia is well-equipped to use technology to improve healthcare outcomes, encourage patients to take control of their own health, and make healthcare operations more efficient. (e-Estonia, 2021).

There is also an option to register for the paid appointment at the IDA Tallinna Keskhaigla. A hospital is offering paid appointments in the following cases:

- A patient needs to make an appointment with a doctor without a referral letter, but there is a requirement for a referral.

- A patient needs healthcare service which is not being financed by the Estonian Health Insurance Fund
- A patient needs to take a test or go through a procedure without the referral letter. This does not include X-rays.
- A patient needs to get a quicker service and wants to avoid waiting lists.
- A patient that does not have health insurance.
- Several requirements must be met during the delivery of medical service (e.g., a family suite, private room) (Ida-Tallinna Keskhaigla, n.d.)

For making a paid appointment, a customer should fill in the form inserting their personal information like name, surname, personal code, email and phone number, specialty, and name of the doctor, and mention the suitable date for the appointment. There is also a field to insert a message for any other additional information or possible questions that customers would like to ask. The hospital employee will then review the request and get back to the person in 2 days, confirming the chosen date and time.

4.2.Azerbaijan

It is important to understand the current situation of healthcare service provision in the Republic of Azerbaijan and what is required to be improved in order to be able to implement online appointments.

The healthcare system of the Republic of Azerbaijan is extremely structured and centrally administered. According to the study “Azerbaijan. Healthcare system structure,” a variety of crucial health-related decisions are made at the national level, and despite having the legal responsibility for regulating the management of the health system, the Ministry of Health has limited influence over regional healthcare providers because they are financially dependent on district health authorities or village governments. (Pharma, n.d.).

Citizens of Azerbaijan can receive free medical care at public hospitals. Public institutions include polyclinics, which offer outpatient treatment, as well as hospitals, and specialty clinics, which offer both outpatient and inpatient services. Despite developments in recent years, Azerbaijan's public healthcare system continues to be ineffective and underfunded. The majority of institutions are in Baku, and outside of the city, there are very few public healthcare facilities that offer services, equipment, and medical personnel. In order to obtain public healthcare services, citizens who live outside of the capital city will probably need to travel to Baku (Expat Arrivals, n.d.).

Beginning on January 1st, 2020, the government intends to make health insurance a requirement for everyone in Azerbaijan. The State Agency on Mandatory Health Insurance was established in 2007 to start this reform, but it has since been continually postponed. The government and McKinsey and Company agreed to work together to create an action plan for extending national healthcare insurance requirements in July 2018. With the goal of gradually expanding the program throughout Azerbaijan, three regions (Mingachevir, Yevlakh, and Aghdash) started experimental insurance initiatives in February 2017 (International Trade Administration, n.d.).

The national eHealth strategy has not yet been publicly adopted in Azerbaijan. However, Azerbaijan has long adopted roadmaps that emphasize the necessity of a particular eHealth strategy. The roadmap includes three strategic targets, which are improving governance structures and strengthening ICT, increasing productivity and operational efficiency of the business environment, and digitising the government and social environment. Each target includes several priorities in order to achieve the goal. The following priorities are stated in the roadmap: establish an independent regulatory body, liberalize the telecommunication

martlet, increase mobile infrastructure investments, extend digital payments, upgrade technology education with the involvement of business, increase knowledge and skills in the ICT sector, and apply ICT in the education system, improve the information system of the government institution and create an end-to-end integrated e-health infrastructure (Yoon, Minges, & Kwitowski, 2019).

The main challenges for developing countries are:

The low maturity of eHealth interoperability is due to the lack of common standards and governance structures in the digital health sector in developing countries**.** Differences in understanding and application of international standards and digital health maturity are major obstacles to cross-border interoperability. It is more crucial to have focused, targeted approach to governance that prioritizes individual projects when it comes to maintaining sustainable eHealth systems, than taking a broader approach to digital health systems. (EU4Digital, 2020)**.**

In Azerbaijan, both governmental and private institutions offer healthcare. Instead of being paid a fixed cost for each service, public healthcare facilities are funded according to the number of hospital beds, staff members, and services they can offer (International Trade Administration, n.d.).

Referring to the statistics of the health system in Azerbaijan, specifically to the main indicators of healthcare and financial expenditures of the state budget on health, we can identify that financial support is important when it comes to implementing any changes in the system. There are 39083 hospital beds in total in 2022.

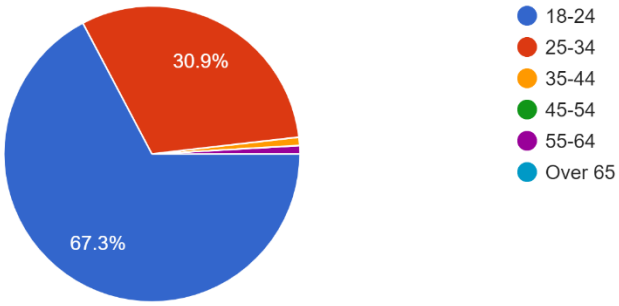
According to the new research in the analysis of the current state of eHealth in the Eastern partner countries (EU4Digital, 2020), one of the challenges, obstacles, and priorities regarding eHealth in Azerbaijan is the lack of funding. This also includes a lack of IT solutions and standards, as well as a lack of staff skills and experience.

5. Result of the research

5.1. Survey

As was mentioned previously, the survey was distributed to the citizens, and 110 responses were received.

Figure 3. Distribution of responders by Age



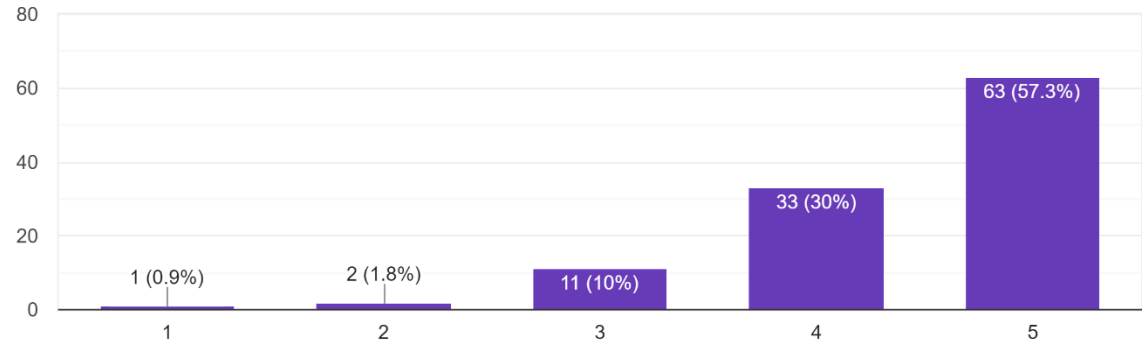
If we take a look at Figure 3. we can see that most of the responses (67.3%) came from citizens in 18-24 age, which makes it 74 responses out of 110. And 30.9%, which makes 34 responses, came from citizens in age between 25-34. The rest of the responses go to the 35-44 and 55-64, one for each group.

Table 1. Distribution by Digital Literacy level

		Digital Literacy level				
		Basic	Expert	High	Moderate	Total
Age	18-24	5	11	33	25	74
	25-34	1	11	14	8	34
	35-44	0	1	0	0	1
	55-64	0	0	0	1	1
Total		6	23	47	34	110

From Table 1, we can identify the number of citizens who chose different levels of Digital Literacy at different ages. Out of the levels of digital literacy, which are basic, expert, high and moderate people between the age of 18-34 chose high level. That is 33 out of 47 (42/7%) answers for that option. The rest of that age group chose moderate, which makes 25 answers, basic level -5 responses, and expert level – 11 responses. The reason to identify the level of Digital Literacy is to underline the importance of it when it comes to digitalizing existing services. People then can easily navigate the tools and find and manage information online very easily.

Figure 4. Level of comfortability to use digital tools and software.



On a scale from 1 to 5, where 1 is not at all comfortable, 2 is slightly comfortable, 3 is moderately comfortable, 4 is very comfortable and 5 is extremely comfortable, there are 63 responses that make up 57.3% for option 5. Most of the responses are from the people who chose a high level of Digital Literacy, as we can see from Table 2 below.

Table 2. Cross-tabulation of Digital Literacy level and Comfortability of usage of digital tools

		Level of comfortability to use digital tools and software					
		1.00	2.00	3.00	4.00	5.00	Total
Digital Literacy level	Basic	0	1	3	1	1	6
	Expert	1	0	0	0	22	23
	High	0	0	1	18	28	47
	Moderate	0	1	7	14	12	34
Total		1	2	11	33	63	110

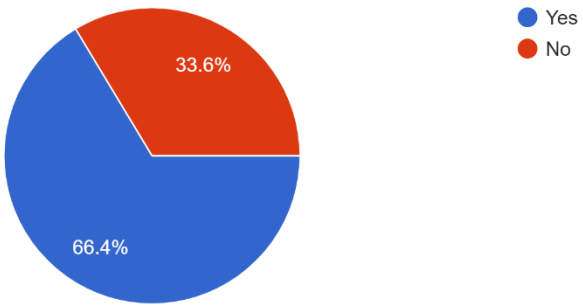
In the same way, we can identify the confidence in the security of personal information in Table 3. On a scale from 1 to 5, where 1 is not at all confident, 2 is not confident, 3 is neutral, 4 is confident and 5 is very confident, there are 47 responses from people with high Digital Literacy varying between neutral, confident, and very confident options of confidence in security when using digital tools and software. This means that in the process of digitalizing the service, easy usage and navigation of the tool as well as the secure storage of personal information plays a significant role in people's acceptance of the technology.

Table 3. Level of confidence in the security of personal information

		Level of confidence in the security of personal information					
		1.00	2.00	3.00	4.00	5.00	Total
Digital Literacy level	Basic	3	1	2	0	0	6
	Expert	1	3	8	5	6	23
	High	1	5	20	15	6	47
	Moderate	2	5	13	11	3	34
Total		7	14	43	31	15	110

It was also important to identify if people are using public hospital websites to find any information they need before making an appointment. From Figure 5, we can see that 66.4% of all responders usually use hospital websites, and 33.6% do not.

Figure 5. Frequency of hospitals websites usage



Nevertheless, how useful the websites are in the responders' opinion, we can see from the crosstabulation in Table 4. There are 73 responses from those who use websites before making an appointment.

Twenty responders think that these websites are not useful at all because the information is usually not updated and most of the features don't work. 37 responses were chosen for the option "somewhat useful", and only 16 people found the websites useful as they could find all information they needed.

Table 4. How useful are the websites.

		Do you use hospital websites		
		No	Yes	Total
How useful are the websites	Not applicable	18	0	18
	Not useful at all, the information usually is not updated and most of the features don't work	8	20	28
	Somehow useful	8	37	45
	Useful, I can find all the information that I need there	3	16	19
Total		37	73	110

It was also important to ask the responders what hospitals they are making appointments at because, as we can see from the result in Table 5., most of the responses are applicable to people who choose private hospitals. There are 80 responses from those who chose private hospitals and 30 responses out of 110 who chose public hospitals. And we can see that 39 people voted for somewhat usefulness of the websites, 13 find them useful with all information needed and 21 out of 80 people think that the websites are not useful at all. It is also important to underline that from the rest of the responders that chose public hospitals, only 12 found the websites somehow useful and useful, considering 6 for each response. Most responses go to "not applicable." This proves that for public hospitals, there are no properly working websites, or they don't have them at all.

Table 5. Interrelation between hospital type and usefulness of the websites

		Type of hospital		
		Private	Public	Total
How useful are the websites	Not applicable	7	11	18
	Not useful at all, the information usually is not updated and most of the features don't work	21	7	28
	Somehow useful	39	6	45
	Useful, I can find all the information that I need there	13	6	19
Total		80	30	110

Since there is no online appointment system in public hospitals in Azerbaijan, it was important to understand how citizens are making appointments. From Table 6, we can see that there were two options for the given question and most of the responses which are 79 out of 110, go to the option of making appointments on the phone, where 64 of them are making appointments on the phone to private hospitals and 15 to the public. And the rest of the

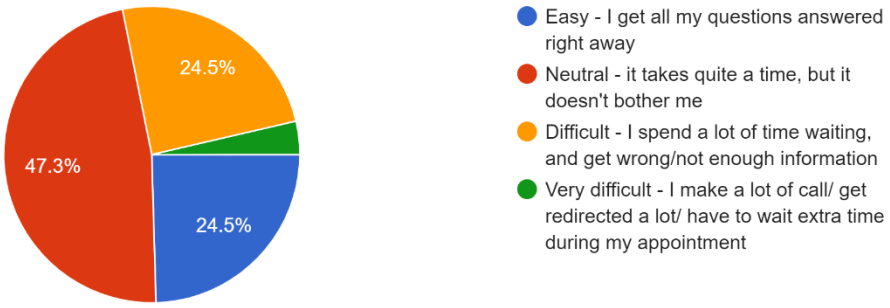
respondents chose the option of making appointments in-person, whereas 16 of them approached private hospitals and 15 public.

Table 6. Appointment option

		Apointment option		
		In-person (in the hospital)	On the phone	Total
Type of hospital	Private	16	64	80
	Public	15	15	30
Total		31	79	110

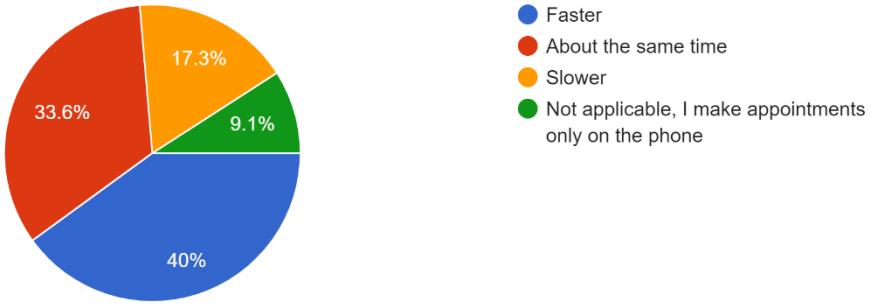
In order to identify the situation better, it was important to understand how easy it is for people to schedule appointments on the phone (Figure 6). The given answers provided responders with the following options to choose from – easy, neutral, difficult, and very difficult. 47.3% of the answers are for option neutral – responders understand that the process takes quite a time, but they don't see it as a problem. And the same number of answers, 24.5%, for both easy and difficult options.

Figure 6. How easy is it to make an appointment on the phone.



For the question about how long it takes citizens to schedule an appointment by phone compared to scheduling in-person (Figure 7.), 40% of responders chose that it is faster, 33.6% chose that it takes about the same time, and only 17.3% chose that it takes more time than to make an appointment in-person.

Figure 7. Time comparison of appointment process



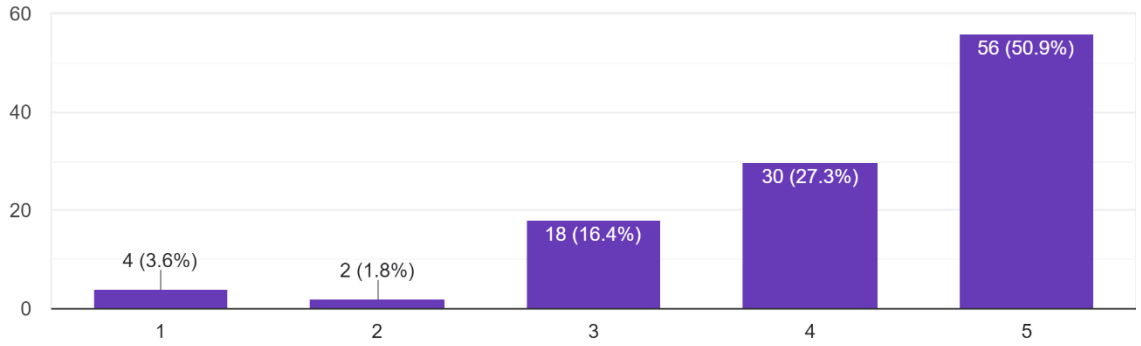
It was very interesting to observe from the answers in Figure 8 that even though people understand the disadvantages of the current situation, it does not disturb or cause any inconvenience for them. Most of the answers that make up to 51.8% chose the “neutral” option for the level of satisfaction with the current appointment system. 39.1% chose that they are dissatisfied and would like to have a better option for making appointments. And only 9.1% are very satisfied and wouldn’t want to change anything.

Figure 8. Level of satisfaction with the current appointment system

However, despite the fact that most people are actually neutral about the current situation if we take a look at Figure 9, where answer 1 is not important at all, and 5 is very important, it helps us to understand how important the availability of online appointment system is for people. There are 56 responses (50.9%) for option 5 and 30 responses (27.3%) for option 4, which means that people would like to have the option to make appointments online and have a record of their appointments. 18 people think that it is somewhat important, they understand the advantages of having it but are satisfied with the traditional method. And only 3.6% and

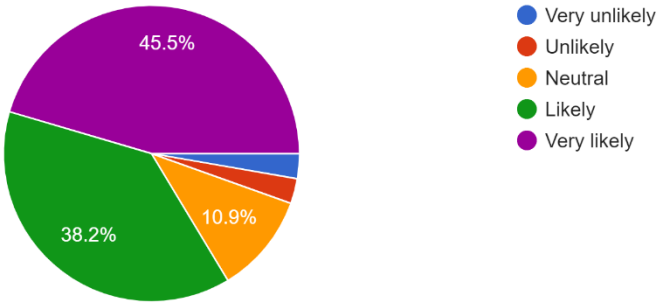
1.8% of all responders think that this process is not important at all and there is no need to have an online appointment system.

Figure 9. Level of importance of online appointment system



Considering the level of importance of an online appointment system for citizens, it was also important to identify how likely they are to use it if there were such a system. According to Figure 10, we can observe 45.5% of respondents chose that they are very likely to use the online appointment, 38.2% chose likely, and only 10.9% responded with neutral.

Figure 10. Online Appointment system Use likelihood.



One of the questions was about the main obstacle in digitalizing the appointments in hospitals, and the point was to understand what people think about it, whether it is the low technical skills of hospital staff or the low technical skills of patients. Most of the responders chose the first option, which makes 56 (51.9%) responses in total. If we take a look at Table 7, we can see the correlation between the digital literacy level of the responders and the option they chose. 21 responses out of 56 are people with high digital literacy level, 18 moderate and 15 expert levels. The low technical skills of patients were chosen by 42 responders, which is 38.9% of all responses. Among them, we can see 20 responses from people with high digital literacy, 13 moderate, 7 experts and only 2

responses with basic levels for each of the answers. We can also see that people chose an option other where they specified that they think both options are relevant.

Table 7. Main obstacle

		Digital Literacy level				
		Basic	Expert	High	Moderate	Total
Main obstacle		0	0	1	1	2
	Low technical skills of hospital staff	2	15	21	18	56
	Low technical skills of patients	2	7	20	13	42
	Other (please specify)	2	1	5	2	10
Total		6	23	47	34	110

There are several important stakeholders responsible for the digitalization of the appointment system in public hospitals. The responders were given 4 options: doctors, hospital management, patients, and the Ministry of Health. If we take a look at Table 7, we can see 62 people chose the Ministry of Health, which is 56.4% of all participants. And 39 people, which is 35.5% of all participants, chose hospital management. This means that the Ministry of Health plays a significant role in the digitalization of the appointment system as well as hospital management. The fact that doctors and patients get the rest of the responses demonstrates that these stakeholders are not excluded from liability.

Table 8. The most responsible stakeholder in the digitalization of the appointment system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Doctors	4	3.6	3.6	3.6
	Hospital management	39	35.5	35.5	39.1
	Patients	5	4.5	4.5	43.6
	The Ministry of Health	62	56.4	56.4	100.0
	Total	110	100.0	100.0	

As the final question, responders were also asked what they would want to add as comments or thoughts about the possibility of having an online appointment system in public hospitals. Only 9 responses out of 110 were received for this question. Some were saying that the implementation of this online appointment system depends on people and how developed they are and ready for this improvement. Another comment was that implementing this system would be very difficult and that keeping the traditional way of making appointments is also necessary in urgent cases. Some people schedule appointments with the doctors they know personally or the ones their relatives know and rarely try out new options.

Moreover, there was one response from the person saying that the Ministry of Health has to create a new appointment system in each hospital and that they can develop the new system. Among the answers, there was a suggestion from one person about showing how to use an online appointment system in interesting and catchy ads on TV, billboards, radio, etc. Someone suggested that online appointments will save time, and it will be easier to choose available dates and times for appointments in public hospitals if we have visibility of it.

5.2.Interviews

The reason for conducting interviews with doctors was to understand the current appointment system in hospitals better and generally to understand the doctors' perspective on the implementation of an online appointment system, which can be linked to research questions. During the analysis of the interviews, the topics such as the current appointment system and its challenges, benefits of digitalization of this service, doctors' concerns about the digitalization of the appointment system, necessary resources and support for the implementation, features that they would like to use, and recommendations were covered.

The current appointment system in hospitals is mostly managed by phone. The first interviewee from the dental clinic Al Sabah, Ulviya Musali, mentioned answering the question that the appointment is scheduled only by phone, and when the patient arrives on time, they schedule the next appointment in-person based on the discussed and chosen date with the doctor. She also underlined that they did not face any problems with that because all the patients arrive on their time.

Another interviewee from a private dental clinic stated that the appointment system is managed with the help of an online assistant - Clinicscard. This system is used internally in the hospital where the interviewee works. He also mentioned that in order to use that, they have to pay an extra fee for the service. The process of scheduling the appointment is carried out according to the time length of the procedure that is going to be done. The preparation of the cabinet is also taken into consideration. This system mentioned above is used internally for the employees allowing them to have visibility for telling a customer on the phone when they have an available spot for the appointment. That being mentioned, the interviewee stated that most of the time the appointment is made on the phone. A live queue is possible only in urgent cases. To answer the question about any challenges or issues that could arise in the current appointment system, he mentioned that if there are no technical problems, delays, or emergency patients, the system works properly.

The third interviewee, who works in the Family and Health Center (that's what polyclinics are called now), Elnara Hashimova, explained how the current appointment system is managed there. She stated that only local pediatricians, therapists, and gynecologists work in these centers. There are no narrow specialists. Outpatient admission is carried out only by face-to-face appointments, i.e., patients come to the clinic, register at the reception, wait for their turn in the line, and then go to see a doctor. Sometimes patients call to see the doctor and ask what time he or she will be at work. In those cases, the doctors can schedule appointments themselves.

The last interviewee, who works in the "Endokrin Merkez" as a psychologist, described how the appointments are scheduled in their clinic. There is a special department that controls the appointments and records patients. However, all of the appointments are scheduled both on the phone and in person when the patients call or arrive at the clinic to discuss the time for the appointments suitable both for the patient and for the doctor.

One of the questions was to understand if the hospitals where the interviewed doctors work have ever considered implementing an online appointment system. The first interviewee stated that they only discussed it and mentioned that an online appointment system could be useful in receiving patients. However, the second interviewee from a private clinic said that this topic had been discussed several times and that they came to the conclusion, that in the medical field, it is only possible to make an online appointment for a consultation. Another option is that the patient could schedule an appointment online, and a member from another team could contact the customer if needed and correct the date and time if it is necessary to change it. He explained that patients could benefit from the system considering that they could have the visibility of available dates and times and then choose the most suitable for them. The interviewee also was asked what features they would like to see if such a system were implemented in hospitals; he replied that having a synchronization with their internal procedures, as was mentioned before – taking into consideration the length of the preparation for the procedure and extra time to prepare the cabinet. When it comes to the question about any concerns that doctors could have about possible online appointment system, the interviewee explained that these concerns will be evident and visible after the implementation of the trial version of the online appointment system in hospitals.

The third interviewee explained her opinion about online appointments, saying that they have both positive and negative aspects. The positive side is that it is convenient for doctors and patients to make rational use of time and reduces queues in the corridors of hospitals and clinics. Furthermore, the negative side could be when a patient arrives requiring an urgent

examination and needs to be checked urgently on the patient's time who scheduled his appointment online. This also explained her concerns about the implementation of the online appointment system.

As the last interviewee stated that they rarely have any issues with the current appointment system, she mentioned that personally, she was thinking about such a system and that both the doctors and patients could benefit from it. However, she never offered or discussed such a solution with her team. Answering the question about the benefits of the system for the hospital where she works, she answered shortly: "Efficiency, convenience, and availability." It is also important to mention that when the interviewee was asked about any concerns about the implementation of such a system, she stated that they are related to the possible age factor when using such system, meaning that the older population has difficulties using technology.

When it comes to the question about features that they would like to see in such system, the interviewee underlined notifications about the appointment.

One of the questions during the interview was about necessary resources and support for the implementation of the system in hospitals. Most of the interviewees replied that they would need additional staff and specialists for managing and settling the system. The last interviewee mentioned specialists as well. However, she also added that in order to implement an online appointment system, hospitals would also need financial support and training to learn how to use the system.

In regard to recommendations or any additional thoughts from the doctors about the system, the first interviewee from the public clinic mentioned that she thinks that the implementation of an online appointment system can help us save time and manage our schedule easily and that she has no further recommendations about it. The second interviewee from the private clinic stated that he is not closely familiar with the system in public clinics and hospitals and explained that this is one of the reasons he cannot recommend or add anything. The rest of the interviewees did not say anything and concluded the answers.

5.3. Conclusion of research results

From the results of the research based on the survey and interviews, we can see that most of the responses that come from the survey are from the 18-24 age group. This is relevant for the paper because it helps to underline one of the obstacles (RQ2), which is low awareness and technical skills among the 35+ age group. This can be proved by the interrelation between the table showing age and digital literacy level. Most of the people didn't find the topic relevant,

considering that some of the responders suggested that they would not want to change anything in the current appointment system. The survey also helped to understand how comfortable people are to use digital tools and software, and the results show us that most of the responders chose that they are very comfortable to be using it. However, from survey results, we also can see that even though people are using hospital websites, most of them find it somehow useful or not useful at all, which helps to understand another obstacle in moving towards digitalization. The level of usability and quality of services provided to people should align with their readiness and comfortability to use digital tools and services.

Interviews helped us to understand the current appointment system better. If we compare responses from doctors in public and private clinics, we can see that in public hospitals, they schedule appointments only on the phone or in-person waiting in the queue. In private clinics and hospitals, there is an internal online system that is used by doctors. However, it only helps them with visibility and management of their available time. This internal online system is later used to provide information about available dates to the patient on the phone. In both cases, there is an obstacle where two appointments can come across if one person was waiting in the line or called beforehand and another person has an urgent request and should be accepted by doctors without waiting.

It was also interesting to observe that most of the interviewees, when answering the question about features they would like to see in the online appointment system, were describing very specific features that could be applied only to the system in their specific clinic or hospital. These expectations can help us to understand better how to introduce the solution to public hospitals and to doctors.

The interviews also helped to understand doctors' opinions about the resources and support that they would need to implement an online appointment system. All of the interviewees explained that there is a need for specialists and financial support as well as training that could help us to learn how to use the system.

6. Recommendations

In this chapter, answers to the research questions will be provided by recommending possible solutions based on the results of the research for the digitalization of the existing appointment system in public hospitals in Azerbaijan.

According to the results of the survey and interviews, there are several recommendations for the topic:

To answer the first research question, we can see that as an outcome of the interviews with doctors from public and private hospitals, it is clear that there is a demand for specialist and financial support.

- Hiring specialists

As was mentioned above, according to the interviewees, there is a need for specialists who could assist in implementing an online appointment system in public hospitals. Hospitals should prioritize hiring specialists, such as IT professionals and project managers, who have experience in implementing digital solutions.

- Financial support

Another recommendation for the Ministry of Health of Azerbaijan is to create a budget for the implementation of online appointment systems: Public hospitals should get funding from the Ministry of Health to implement a digital appointment system. This budget should cover all costs related to setting the new system into place, including those for hardware, software, training, and other costs.

Additionally, the Ministry of Health should allocate funds for constant technical assistance to hospitals in setting up and maintaining an online appointment system. The provision of ongoing training and assistance to hospital staff should also be part of this support, as should the hiring of IT experts and project managers.

The Ministry of Health of Azerbaijan could also provide monetary bonuses to institutions in the form of financing for maintenance and improvement, as well as grants to cover all the costs of implementation of the digitalized system.

Partnership, encouraged by the Ministry of Health, with private sector companies who specialize in developing online appointment system is another recommendation that can help public hospitals access the latest technologies in the field.

The implementation of an online appointment system in public hospitals should also be monitored to ensure that this new system is working effectively and efficiently. This could involve collecting feedback from patients and hospital staff and improving something if required.

Several benefits could be achieved, such as improved efficiency, reduced waiting times, and better care for patients, if the Ministry of Health would provide financial support for the implementation of online appointment system in public hospitals. It is important for the Ministry of Health to work closely with hospital staff and IT specialists to ensure that the new system is implemented successfully.

In the second research question, we want to understand the obstacles to the digitalization of the appointment system. According to the survey outcomes, we can say that it is low technical skills for both patients and hospital staff.

- Low technical skills

The Ministry of Health should organize the trainings for doctors, nurses, and other hospital staff on how to use online appointment system so that they can also share with patients how to use it. Patients who are not very well familiar with technology or have low digital literacy could participate in workshops or online tutorials created by hospitals.

The Ministry of Health of Azerbaijan, being the most responsible stakeholder according to the survey results, should consider implementing a user-friendly digital appointment system that is easy to use. The new system should also integrate with the existing appointment system to ensure a smooth transition.

The point of the third research question was to understand how to introduce the solution to public hospitals and patients.

- Raising awareness

Survey results showed us that most of the answers were received from the age group below 35. Therefore, another recommendation is to raise awareness among the 35+ age group. One of the ways to increase awareness among older groups is to encourage people to participate in feedback surveys, provide easy access to the service with a design that provides a good user experience, making sure that people’s privacy and personal data will be secured.

When trying to raise awareness about the benefits of the online appointment system, such as faster appointments and enhanced convenience, the Ministry of Health should consider the 35+ age group as the main target.

To involve older population, hospitals could partner with senior centres to help raise awareness and provide training on the digital appointment system.

Despite the obstacles, such as low technical skills and digital literacy, that could arise during the implementation of an online appointment system, the new digitalized system in hospitals can be beneficial for both patients and staff.

- Online appointment platform

As the last research question focuses on how an online appointment system can be applied to the service provision in Azerbaijan, proposing a platform idea based on the example from Estonia is another recommendation to the Ministry of Health.

Estonia is well known as a leader in developing and implementing e-governance solutions, including the digitalization of healthcare services. (Paraskevopoulos, 2021) There are several ways in which Estonia could help Azerbaijan implement an online appointment system for its hospitals:

- Estonia could offer to share its expertise and lessons learned in developing and implementing e-governance solutions, including online appointment systems, with Azerbaijan. To assist Azerbaijan in learning from Estonia's accomplishments and challenges might involve exchanging best practices, expertise in technology, case studies, reports, and other resources.
- Estonia could provide technical support to Azerbaijan in developing and implementing an online appointment system in public hospitals. This includes collaboration with Azerbaijan on the development of the platform and making sure it meets all the necessary requirements.

The platform could help improve the management of the appointment system in hospitals. However, the old way of scheduling the appointment could remain as the option for those who don’t feel comfortable using the new technology, enabling a smooth transition to digitalization over time.

The suggestion to the Ministry of Health is to create a platform that will be beneficial both for patients and hospital staff; therefore, it would have two profile options – patients and doctors.

For the patient profile, people would be able to choose the healthcare providers, services, and possible dates for the scheduling and then see the options they can choose from. After choosing the healthcare provider, they could continue with the option and see more detailed information and confirmation for the day and time they chose. And later, revisiting the platform, they can see the history of all their appointments with the doctors.

And for the doctors, this profile could enable editing their schedule so that it can align with the available dates for patients' visibility.

To register in the online appointment system, considering that it would have two profile options, as it was mentioned before, users would have registering options accordingly.

For patients, there are several options for secure registration for making online appointments:

- Although Azerbaijan does not have SmartID like Estonia does, patients can still register on the platform for verification using their national ID cards. They can enter their national ID number and get verified with the help of a government database.
- Another option is that patients can register and get verified with their phone numbers. They will receive a verification code, which patients can use on the platform for identity confirmation.
- Email is another option that a patient can use to get verified. During registration, a patient will receive a verification link to the email to complete the process.

Any registration procedure should be user-friendly, secure, and compliant with Azerbaijani privacy and data protection law. (The Cabinet of Ministers of the Republic of Azerbaijan, 2010).

To ensure secure registration for the doctors, several possible solutions can be considered. During registration, doctors could submit their proof of medical license for verification purposes. This could include not only their license number but a scanned copy of the document. Education and work history could also be checked through a third-party verification service when they register.

Another method of verification could be to confirm doctors' credentials through their professional associations, including verification of doctors' credentials and participation in any relevant medical organizations or associations.

The last option could be registration with doctors' credentials and employment status integrated with the hospital system on the platform, if applicable.

By using one of the mentioned methods for a secure registry of doctors, the platform can ensure that only qualified doctors can register and patients can securely schedule appointments.

7. Summary

To conclude the paper, the results of a survey conducted among citizens of Azerbaijan on the topic of digitalization of the appointment system were analysed. Questions about respondents' age, digital literacy, comfortability in using digital tools and software, level of confidence in the security of personal information, and the usefulness of hospital websites were included in the survey. One of the outcomes of the survey showed that most responses were received from the 18-24 age group, where respondents had a high degree of digital literacy and were very comfortable using digital tools and software. It also specified citizens' concerns about the usefulness of hospital websites and the security of personal information. In addition, there was a low level of awareness and technical skills among the 35+ age group, and many did not find the topic relevant. The survey and interview results helped to understand that the level of usability and quality of services provided to people needed to align with their readiness and comfortability to use digital tools and services. The findings suggest that digitalizing the appointment system may require more attention to website development and user security, particularly for public hospitals.

The study aimed to understand the current appointment systems in hospitals and the doctors' perspectives regarding the implementation of an online appointment system. Four doctors were interviewed, and their responses analysed. As an outcome, it was identified that public hospitals schedule appointments only by phone or in person, while most private clinics use an internal online system for visibility and management of their available time. Even though the doctors suggested that online appointment systems could be useful for receiving patients, there were concerns about emergencies and the ability of older patients to use technology. The doctors identified the need for additional staff and specialists to manage the online appointment system, as well as highlighted the need for financial support and training to implement an online appointment system.

Based on the outcomes from the survey and interviews with medical professionals from both public and private hospitals, recommendations have been made to the Ministry of Health. The results were used to define the answers to the research questions, which focus on the demand for specialist support, financial support, obstacles in the digitalization of the appointment system, how to introduce the solution to public hospitals and patients, and the platform for online appointments in Azerbaijan, that is beneficial for both patients and hospital staff.

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07.05.2023

Appendix 2 – Survey questions

1. What is your age?

2. What is the highest degree you have completed?
    - High school degree or equivalent
    - Bachelor's degree
    - Master's degree
    - Doctorate
    - Other (Please specify)
    - Prefer not to say.

3. How would you describe your digital literacy? (Digital literacy refers to the ability to use and navigate digital technologies and tools, including computers, smartphones, software applications, and the internet.)
    - Basic
    - Moderate
    - High
    - Expert

4. On a scale of 1 to 5, how comfortable are you using digital tools and software (e.g., email, browsers, web pages, social media, etc.)?
    - 1 - Not at all comfortable
    - 2 - Slightly comfortable
    - 3 - Moderately comfortable
    - 4 - Very comfortable
    - 5 - Extremely comfortable

5. How confident are you in the security of your personal information while using digital tools and software?
    - Very confident
    - Confident

- Neutral
- Not confident
- Not at all confident

6. Do you use hospital websites to find information that you need before making an appointment to the hospital?
    - Yes
    - No

7. If yes, how useful do you think they are?
    - Not useful at all, the information usually is not updated and most of the features don't work.
    - Somehow useful
    - Useful, I can find all the information that I need there.

8. What hospitals do you usually make appointments to?
    - Public
    - Private

9. How do you make appointments at the hospital?
    - On the phone
    - In-person (in the hospital)

10. How satisfied are you with the current appointment system?
    - Very satisfied, I wouldn't want to change anything.
    - Neutral, I understand the disadvantages, but they don't bother me.
    - Dissatisfied, I would like to have a better option for making appointments.

11. How easy is it for you to schedule an appointment on the phone?
    - Easy, I get all my questions answered right away.
    - Neutral, it takes quite a time, but it doesn't bother me.
    - Difficult, I spend a lot of time waiting to get an answer and I I feel like I'm given wrong/not enough information.

- Very difficult, I mostly make a lot of calls, get redirected a lot, and/or on the scheduled day I have to wait extra time.

12. How long does it take you to schedule an appointment by phone compared to scheduling in-person?
    - Faster
    - About the same time
    - Slower
    - Not applicable, I make appointments on the phone.

13. How important is the availability of an online appointment system in hospitals for your medical needs?
    - Not important at all
    - Somewhat important
    - Neutral
    - Important
    - Very important
14. If there would be an option to use an online appointment system to schedule appointments at the hospital, how likely are you to use it?
    - Very likely
    - Likely
    - Neutral
    - Unlikely
    - Very unlikely

15. What is the main obstacle in digitizing the appointments in hospitals?
    - Low technical skills of hospital staff
    - Low technical skills of patients
    - Other

16. Who in your opinion is the most responsible stakeholder in the digitalization of the appointment system in hospitals in Azerbaijan?
    - The Ministry of Health

- Hospital management
- Doctors
- Patients

17. Any additional comments or suggestions regarding the possibility of having an online appointment system in hospitals?

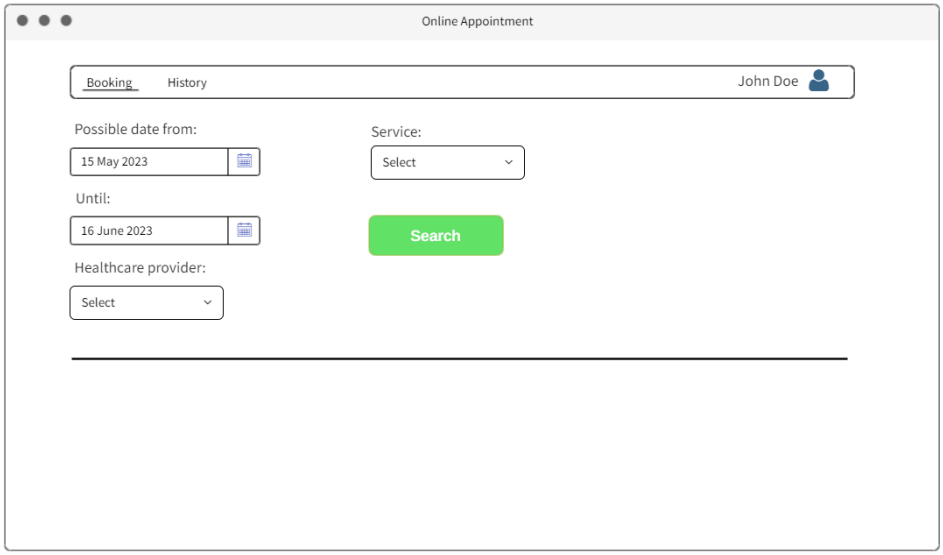
Appendix 2 – Interview questions

During the interview the reason for this interview will be explained in the first place and the option to keep the identity confidential will be offered. The interview questions are the following:

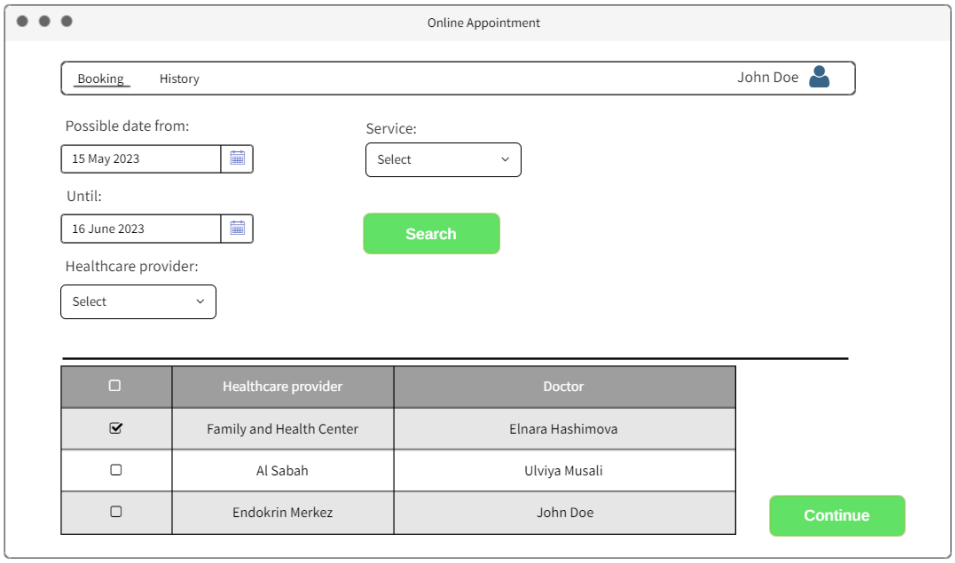
1. How does your hospital currently manage and maintain appointment scheduling?
2. Can you walk me through the process of scheduling an appointment from start to finish?
3. How do patients typically schedule appointments with your hospital? (e.g., phone, in-person, online)
4. Are there any challenges or issues that arise with the current appointment scheduling process?
5. Have you ever considered or discussed implementing an online appointment system?
6. What do you think would be the benefits of an online appointment system for your hospital?
7. Are there any potential drawbacks or concerns you have about implementing an online appointment system?
8. What features or capabilities would you like to see in an online appointment system?
9. What resources or support would your team need to successfully implement an online appointment system?
10. Is there anything else you would like to add or what would you recommend for the implementation of an online appointment system in public hospitals?

Appendix 3 – Online Appointment system

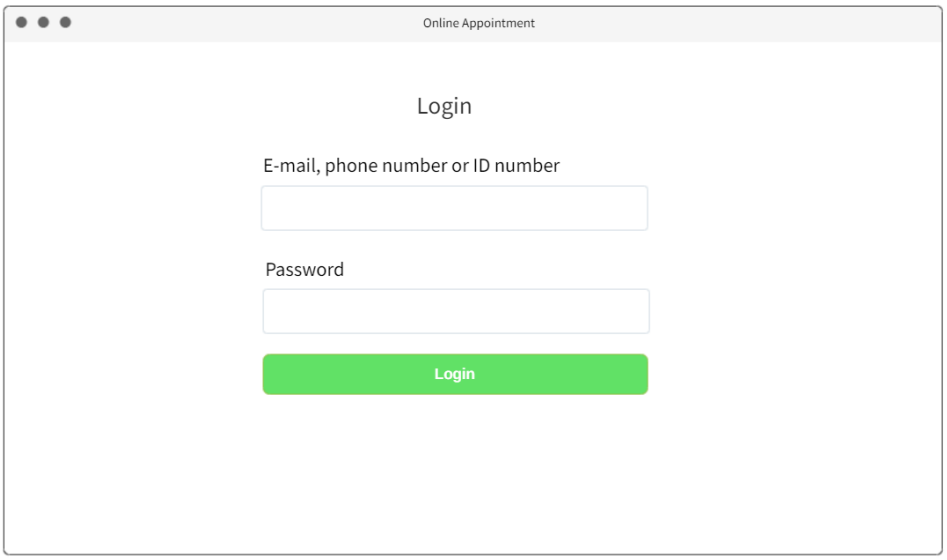
Booking appointment



Searching for the suitable appointment



Login options for patient



Login option for doctor