

**Using Modern Information Technologies as a Basis for Re-Engineering University
Business Processes: Admission Processes in Kazakhstan**

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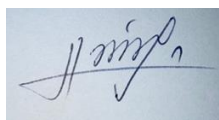
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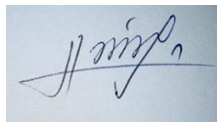
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Abstract

As part of the reengineering of public administration processes in Kazakhstan, digital solutions are increasingly being proposed to improve the efficiency and transparency of public services. One of these areas is the digitalization of the process of student admission to higher education institutions. This study focuses on the analysis of the implementation of this process in one of the large universities in Central Kazakhstan. The purpose of the study is to study the perception of digitalization by applicants and admissions staff, as well as to identify factors that facilitate and hinder the effective implementation of digital solutions. The study is based on a qualitative approach and includes semi-structured interviews and analysis of regulatory documents. The results showed that the first stage of digitalization — submitting applications for an educational grant competition through the eGov platform — was perceived positively but was not been fully implemented: technical failures persisted, especially during peak periods, and some applications continued to be processed manually. The second stage, related to the submission of original documents, was mainly carried out offline, which limited the potential of digital transformation. The factors identified in the study, such as the integration of information systems, the level of digital literacy of users and institutional readiness, highlight the need for an integrated approach to the digitalization of educational services.

Keywords: digitalization, University admission, reengineering, eGov, higher education.

Аңдатпа

Қазақстанда мемлекеттік басқару процестерінің реинжинирингінің бөлігі ретінде мемлекеттік қызметтердің тиімділігі мен ашықтығын арттыру үшін цифрлық шешімдер жиі ұсынылуда. Осы бағыттардың бірі – жоғары оқу орындарына студенттерді қабылдау үдерісін цифрландыру. Бұл зерттеу Орталық Қазақстандағы ірі университеттердің бірінде осы процестің жүзеге асырылуын талдауға бағытталған. Зерттеудің мақсаты – талапкерлер мен қабылдау қызметкерлерінің цифрландыруды қабылдауын зерттеу, сонымен қатар цифрлық шешімдерді тиімді енгізуге ықпал ететін және кедергі келтіретін факторларды анықтау. Зерттеу сапалы әдіске негізделген және жартылай құрылымдық сұхбаттар мен нормативтік құжаттарды талдауды қамтиды. Нәтижелер цифрландырудың бірінші кезеңі – eGov платформасы арқылы білім беру гранты бойынша конкурса өтінімдерді беру – оң қабылданатынын, бірақ толық орындалмағанын көрсетті: техникалық ақаулар, әсіресе көп өтінімдерді қабылдау кезеңдерінде сақталуда, ал кейбір өтінімдерді қолмен өңдеу жалғасуда. Құжаттардың түпнұсқасын ұсынумен байланысты екінші кезең негізінен офлайн режимде жүзеге асырылады, бұл цифрлық трансформацияның әлеуетін шектейді. Зерттеу барысында анықталған ақпараттық жүйелердің интеграциясы, пайдаланушылардың цифрлық сауаттылық деңгейі және институционалдық дайындығы сияқты факторлар білім беру қызметтерін цифрландыруға кешенді тәсілдің қажеттілігін көрсетеді.

Түйін сөздер: цифрландыру, университетке қабылдау, реинжиниринг, eGov, жоғары білім.

Аннотация

В рамках пересмотра и модернизации процессов государственного управления в Казахстане все чаще предлагаются цифровые решения, направленные на повышение эффективности и прозрачности государственных услуг. Одним из таких направлений стала цифровизация процесса приема студентов в высшие учебные заведения. Данное исследование сосредоточено на анализе реализации этого процесса в одном из крупных университетов Центрального Казахстана. Целью исследования является изучение восприятия цифровизации со стороны абитуриентов и сотрудников приемной комиссии, а также выявление факторов, способствующих и препятствующих эффективному внедрению цифровых решений. Исследование основано на качественном подходе и включает полуструктурированные интервью и анализ нормативных документов. Результаты показали, что первый этап цифровизации — подача заявлений на конкурс образовательных грантов через платформу eGov — воспринимается положительно, однако реализован не полностью: сохраняются технические сбои, особенно в периоды пиковой нагрузки, а часть заявлений продолжает обрабатываться вручную. Второй этап, связанный с подачей оригиналов документов, преимущественно осуществляется офлайн, что ограничивает потенциал цифровых преобразований. Выявленные в ходе исследования факторы, такие как интеграция информационных систем, уровень цифровой грамотности пользователей и институциональная готовность, подчеркивают необходимость комплексного подхода к цифровизации образовательных услуг.

Ключевые слова: цифровизация, прием в университет, реинжиниринг, eGov, высшее образование.

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Chapter 1: Introduction

The first chapter of this thesis is devoted to introducing the research topic — the use of modern information technologies as the basis for reengineering business processes of universities in Kazakhstan, with a focus on admission processes. This chapter describes the background of the study, problem statement, objectives and research questions, and significance of the study. The chapter ends with a brief conclusion.

1.1 Background of the Study

Digitalization has long been a global trend that affects all aspects of the economy and society. Today, the technological shift has affected every industry. The use of information technology (IT) to modernize business management, public services, and education systems is actively developing around the world. For example, the e-Estonia system, which is one of the most advanced digital government platforms in the world, has been operating in Estonia for several years. Within digitalized government systems, citizens can access a wide range of services electronically, from business registration to tax filing, enhancing efficiency and accessibility (OECD, 2020). In the field of higher education, universities in the United States and Europe have actively adopted online learning environments and learning management systems to improve teaching and administrative efficiency (Weller, 2020). Furthermore, according to UNESCO (2020), digitalization plays a critical role in enhancing the transparency, resilience, and management capacity of educational systems. The introduction of digital technologies in the management of educational institutions helps to improve the quality of educational services, as well as increase the efficiency of the institutions themselves.

In addition, the introduction of IT in educational processes is becoming an important element of national digitalization strategies. In many Asian countries, such as South Korea and Singapore, governments are actively supporting the introduction of

digital technologies in the management of universities and educational processes. In South Korea, for example, the concept of “smart learning” allows students and teachers to use cloud technologies to organize their learning, which significantly increases the efficiency of the educational process (Budhrani et al., 2018). These examples show that digitalization is a global process aimed at improving the quality and accessibility of educational services around the world.

Like other countries, Kazakhstan is actively introducing digital technologies into the education system. Digitalization of higher education is one of the key priorities outlined in the State Program for the Development of Education and Science 2020–2025, which emphasizes the creation of an information society and the improvement of digital competencies at all levels of education (Ministry of Education and Science of the Republic of Kazakhstan, 2020). One of the key initiatives promoting digitalization in Kazakhstan has been the introduction of the electronic government system (e-Gov) in 2006. This system has significantly simplified citizens’ access to public services, including the process of submitting documents to higher education institutions. In 2023, the Ministry of Education and Science of the Republic of Kazakhstan (MES RK) introduced the possibility of submitting applications to universities via e-Gov, which reduced the processing time for applications, reduced the administrative burden on admissions committees and increased the transparency of procedures (MES RK, 2023).

One of the most significant challenges facing higher education institutions in Kazakhstan is the need to enhance management efficiency and the quality of educational services. This is particularly crucial in a rapidly evolving labor market, where there is a continuous demand for high-quality and efficient educational offerings. According to the OECD (2017), Kazakhstan's higher education system contends with issues such as limited public funding, inefficient resource allocation, and residual central planning practices, all

of which hinder institutional performance and responsiveness to labor market needs. Further, Mukhatayev et al. (2024) highlight systemic problems within the quality assurance framework, including outdated curricula, insufficient infrastructure, and underqualified staff, which collectively undermine the effectiveness and quality of higher education services. The introduction of IT and business process reengineering (BPR) in educational institutions are becoming essential tools for addressing these issues.

Digitalization of educational processes in Kazakhstan encompasses areas such as online learning, virtual classrooms, the automation of administrative procedures, and the introduction of learning management systems. These features are increasingly integrated into the higher education sector and contribute to improving the efficiency and effectiveness of educational institutions (Ministry of Education and Science of the Republic of Kazakhstan, 2021; UNESCO, 2020).

However, the implementation of IT and BPR in Kazakhstan is accompanied by several challenges. Significant investments in IT infrastructure require long-term commitment from the government and universities (OECD, 2017). Additionally, institutional resistance to change and the lack of clear digitalization strategies are significant barriers to the implementation of new technologies (Dzhanegizova, 2024). For example, reengineering admission processes requires rethinking current practices and adapting them to the requirements of the digital era (Kotter, 1996).

International experience shows that these challenges are surmountable. For instance, Udayana University in Indonesia successfully implemented the reengineering of admission processes for international students, reducing the application processing time from 60 to 29 days (Pramartha & Mimba, 2020). This example illustrates how IT and BPR can improve the quality and speed of educational services.

Thus, digitalization and BPR can play an important role in the transformation of the educational system of Kazakhstan. The introduction of advanced technologies and the revision of existing processes are necessary steps towards increasing the competitiveness of Kazakhstani universities in the international arena. However, the successful implementation of these initiatives requires not only state support, but also the readiness of educational institutions themselves for change.

1.2 The Statement of Problem

Despite significant achievements in digitalization, the implementation of new technologies and process reengineering in Kazakhstani universities faces several challenges. A primary issue is adapting existing processes and structures to new working conditions, necessitating substantial efforts in staff training, motivation, and the integration of various information systems (Dzhanegizova, 2024). Institutional resistance to change and the absence of clear digitalization strategies further hinder the effective adoption of new technologies.

Reengineering and digitalization of admission processes is driven by several factors. Firstly, the growing volume of applications from applicants and the need to manage large amounts of data require the implementation of automated systems. Such systems help to minimize errors, accelerate data processing, and increase transparency in administrative operations (OECD, 2021). Secondly, digitalization enhances convenience for applicants by allowing them to submit documents remotely, track the status of applications, and receive consultations through online platforms. These improvements have become particularly critical during the pandemic and post-pandemic periods, when traditional, in-person processes often proved ineffective (European Commission, 2020).

However, the implementation of digitalization initiatives faces several difficulties. The lack of a unified digital infrastructure and insufficient staff training can slow down

digital transformation efforts in educational institutions (World Bank, 2020). Moreover, there is a risk of exacerbating the digital divide when access to technology is uneven, particularly for applicants from rural or remote regions (UNESCO, 2020). Therefore, the study aims to identify the key factors that contribute to the successful implementation of information technology in admission processes.

It is also important to study how reengineering of admission processes can contribute to achieving the strategic goals of universities, such as increasing competitiveness, compliance with international standards, and strengthening trust with applicants and their families. Reengineering involves a fundamental rethinking of existing processes, which may require significant resources and institutional commitment but provides opportunities for optimization, the elimination of redundant operations, and improvements in service quality (Hammer & Champy, 1993).

Thus, this study focuses not only on the analysis of successful practices, but also on identifying potential problems of digitalization. This is necessary for developing recommendations for adapting admission processes to the modern requirements of the digital era, which is important both for Kazakhstani universities and for the education system.

The objective of this study is to analyze the experience of admissions committees of higher education institutions in Kazakhstan in the context of changes in admission processes in the context of digitalization. It is important to consider that admission processes to higher education institutions are one of the key elements of university management, directly affecting the transparency, efficiency and accessibility of higher education.

1.3 The purpose of Research and Research Questions

The purpose of this study is to examine the factors influencing the successful implementation of information technology in university admission processes based on the results of BPR. The study will analyze the current state of digitalization of admission procedures, identify key success factors and barriers to IT implementation, and offer recommendations for improving these processes, considering the adaptation of admissions officers of universities in Kazakhstan.

Thus, this study aims to examine the process of digitalization of admissions committees at universities in Kazakhstan, which will make it possible to develop recommendations for the effective implementation and use of information technologies to improve the quality and efficiency of educational services. To achieve this goal, the following research questions were posed:

1. How does the introduction of digital technologies affect the admission processes in universities in Kazakhstan?
2. What are the main problems and challenges that admissions committees face when digitalizing admission processes in universities?
3. What factors contribute to the successful reorganization of admission processes in universities in the context of digitalization?
4. What recommendations can be proposed to improve the admission processes in universities based on the experience of introducing digital technologies?

Defining Key Concepts

Digitalization is the process of transition from traditional methods of management and interaction to the use of digital technologies and automated systems to optimize business processes and improve work efficiency (Brennen & Kreiss, 2016). *Information technology* (IT), in turn, is a set of hardware and software that ensure the processing,

storage and transmission of information (Turban et al., 2018). Digitalization includes the use of IT, but also affects a wider range of transformation processes.

Business process reengineering (BPR) is the radical redesign and rethinking of existing processes to achieve significant improvements in quality, speed, cost, and efficiency (Hammer & Champy, 2009). In educational institutions, reengineering aims to improve processes such as student admissions, learning management, and resource management.

1.4 Significance of the Study

This study makes an important contribution to expanding knowledge in the field of digitalization and business process reengineering (BPR) within the higher education system. By focusing on the digitalization of admission processes in Kazakhstan, the research addresses an existing gap in understanding how information technologies impact administrative efficiency, transparency, and accessibility in university settings. Through the analysis of participants' experiences and document review, the study is expected to provide empirical insights into both the benefits and challenges of digital transformation in higher education institutions.

The study holds theoretical significance by offering context-specific perspectives that can inform further academic discussions on digitalization, organizational change, and institutional adaptation. It contributes to enriching theoretical frameworks by highlighting how fragmented digitalization, technical barriers, and institutional practices influence the implementation of digital initiatives, reflecting challenges like those identified by the European Commission (2020), such as the need for stronger digital infrastructure and institutional capacity-building.

In practical terms, the research is significant for policymakers and university administrators. Based on the findings, the study is expected to provide recommendations

for improving the regulatory framework, strengthening technical infrastructure, enhancing digital literacy among applicants, and supporting the full transition to digital admission processes. These insights can help decision-makers better understand the real-world challenges faced by universities and contribute to more effective strategies for supporting digital transformation.

Furthermore, as emphasized by the OECD (2021), the effective integration of digital technologies can streamline administrative processes, enhance institutional efficiency, and improve the overall quality of educational services, making the findings of this study relevant for both national educational reforms and institutional development. By identifying best practices for digitalization and offering evidence-based recommendations, the study aims to support both the strategic management of universities and the broader goals of educational modernization in Kazakhstan.

1.5 Outline

The introduction provides the basis for further analysis and discussion of the research problem. Subsequent chapters will present a critical assessment of existing literature, research methodology, results and discussion, as well as conclusions and recommendations for improving admission processes in higher education institutions in Kazakhstan in the context of digitalization.

Chapter 2: Literature Review

The chapter analyzes research on the digital transformation of admission processes at universities, including the impact of IT on their efficiency and transparency. It examines global practices, challenges associated with the implementation of information systems, and their effects on different participants in the admission process. In conclusion, gaps in the existing research are identified, the need for further analysis is justified, and the theoretical frameworks underpinning the study — including theories of organizational change and institutional theory — are outlined to guide the interpretation of the research findings.

2.1 Introduction

BPR is an important tool for improving the efficiency and quality of organizations, including educational institutions. According to Hammer and Champy (1993), reengineering allows for a radical revision of existing processes to achieve significant improvements in key performance indicators, such as speed and quality. Davenport and Short (1990) emphasize that the introduction of information technology plays a key role in the successful implementation of reengineering, as it allows for the automation and optimization of many aspects of organizational activities.

For universities facing increasing competition and increased student expectations, the use of BPR is becoming especially relevant. For example, Iansiti and Lakhani (2020) note that modern technologies enable universities to speed up administrative processes and improve service quality. Although their research focuses broadly on organizations, the principles of digital automation and improving service experience are equally applicable to higher education institutions. As Fountaine et al., (2019) argue, the automation and digitalization of processes, such as student admissions, can not only improve efficiency but also improve user experience. In the context of global digital transformation, educational

institutions must adapt to these changes to remain competitive. In addition, the introduction of information technology can significantly improve the transparency and accessibility of admissions processes, which is an important factor for applicants. In the context of globalization and digitalization of education, universities that successfully implement modern technologies gain competitive advantages by attracting more talented students and improving their reputation in the international arena (Westerman et al., 2014).

The purpose of this literature review is to study existing approaches and practices of using modern information technologies in reengineering business processes of universities, with an emphasis on admissions processes in Kazakhstan. Tasks include:

- Study of the conceptual foundations of reengineering.
- Analysis of the role and types of information technologies in reengineering.
- Review of current admissions processes at universities in Kazakhstan and opportunities to improve them.

2.2 Conceptual Foundations of BPR

In the context of rapid changes in the global economy and technological progress, organizations are faced with the need for a radical revision of their business processes. Instead of traditional methods of gradual improvements, an approach oriented towards fundamental transformations is emerging – BPR (Hammer & Champy, 1993; Davenport, 1993). According to research, BPR becomes especially relevant during periods of crisis or technological revolutions, when existing processes are no longer able to provide the required efficiency. This section will consider the definition of reengineering, its main components and stages.

2.2.1 Definition of BPR

BPR is defined as a fundamental rethinking and radical redesign of business processes to achieve significant improvements in critical metrics such as cost, quality,

service, and speed (Hammer & Champy, 1993). The concept emerged in response to the growing demands of organizations for radical change rather than incremental improvements. Michael Hammer, one of the founders of the concept, defines BPR as a “fresh start” in organizing processes to achieve radical change (Hammer, 1990). He emphasizes that many outdated processes can no longer be simply optimized and require a complete overhaul.

Furthermore, Davenport (1993) argues that reengineering focuses not only on processes but also on managing changes in organizational structure and culture. He adds that successful reengineering requires the integration of modern technologies to support the new process design. Fountaine et al. (2019) confirm that digitalization and automation are becoming key drivers of successful reengineering, helping organizations achieve higher performance indicators.

Rummler and Brache (1995) offer a more structured approach to BPR, arguing that reengineering involves not only process redesign, but also improving interactions between different levels and departments of the organization. They emphasize the need to consider both internal and external factors that affect organizational processes.

Thus, BPR is a multi-level process that includes radical changes not only in individual business processes, but also in the management of the organization. The introduction of modern technologies, changing the organizational culture, and process redesign are the main components that ensure the success of BPR. This confirms the importance of an integrated approach aimed at transforming the organization to achieve long-term competitiveness.

2.2.2 History and Development of the Concept of Reengineering

The concept of BPR was first proposed in the early 1990s by Michael Hammer and James Champy. In their book *Reengineering the Corporation*, they argued that many

companies were facing a performance crisis caused by outdated processes and needed to completely rethink their operating methods to survive in a highly competitive environment (Hammer & Champy, 1993). Hammer emphasized that process improvements should not be incremental or minimal, but should be based on radical, ground-up changes to management approaches.

Before the term reengineering was coined in the 1990s, similar ideas for reforming organizational processes had been developed within the early 20th century scientific management movement of Frederick Taylor, who focused on improving productivity through improving work processes (Taylor, 1911). However, unlike Taylorism, reengineering focuses not only on optimizing operations but also on fundamentally redesigning all business processes, often with an emphasis on the introduction of information technology.

Information technology (IT) has played a key role in the development of the concept of reengineering from the very beginning. Davenport and Short (1990) emphasized that reengineering is unthinkable without the use of IT, which allows organizations to radically change their processes and achieve significant improvements in productivity. In the 1990s, the development of IT, including the emergence of enterprise information systems and ERP (Enterprise Resource Planning) systems, made it possible to redesign many business processes to improve efficiency.

In the early 2000s, the concept of BPR underwent further development with the advent of the Internet and digital technologies. The Internet made it possible to speed up processes and increase the scale of interaction between different departments of companies and their customers, which made it possible to reengineer business processes more effectively (Davenport, 2003). This phase was also marked by an emphasis on automation

and integration of processes, which allowed for significant cost reduction and increased data processing speed.

Since the 2010s, reengineering has been actively using the capabilities of new technologies such as big data, artificial intelligence (AI), and machine learning (ML) to further optimize business processes. Fountaine et al. (2019) note that the use of AI and big data analytics has allowed organizations to automate complex processes, improve decision making, and increase process agility. Iansiti and Lakhani (2020) emphasize that the integration of digital technologies is becoming a decisive factor for successful reengineering in modern business, which requires the adaptation of not only processes but also the entire management structure.

Thus, the evolution of the concept of BPR reflects the transition from the initial attempts to radically change individual processes to an integrated approach that includes the integration of IT, automation, and the use of artificial intelligence. This concept continues to evolve, enabling organizations to adapt to new challenges of the digital age and remain competitive.

2.2.3 Main Components and Stages of Reengineering

Reengineering includes four key stages. The first involves identification of existing processes and their shortcomings. Hammer and Champy (1993) emphasize the importance of careful analysis to identify bottlenecks and problem areas. This phase includes data collection, employee interviews, and analysis of current performance indicators. The second involves developing new approaches and processes that are radically different from current ones. Davenport (1993) argues that successful BPO requires creative thinking and innovation. At this stage, it is important to consider the capabilities of modern technologies and industry best practices. The third stage consists of implementing and adapting the new processes within the organization. Hammer (1996) notes that implementation must be

accompanied by careful planning and staff training. Successful implementation also requires a shift in organizational culture and effective change management. The fourth stage involves continuously monitoring and evaluating the effectiveness of the new processes to ensure they meet organizational goals (Davenport, 1993; Harrington, 1991; Kane et al., 2016). This stage includes the use of key performance indicators (KPIs) and ongoing optimization based on collected data.

2.3 Modern Information Technologies in Reengineering

2.3.1 The Role of Information Technology in Reengineering

Information technology plays a key role in BPR by providing tools for automation, process optimization, and improved data management. Venkatraman (1994) emphasizes that IT enables organizations to quickly adapt to change, creating new opportunities for innovation and efficiency gains. These technologies enable the automation of routine tasks, which reduces costs and minimizes the likelihood of human error. Kaplan and Norton (1992) add that the use of IT facilitates accurate performance measurement and monitoring of key performance indicators (KPIs), which enables organizations to adjust their strategies based on data.

Modern technologies such as artificial intelligence (AI), big data analytics, and machine learning significantly expand the possibilities of business process reengineering (BPR). Fountaine, McCarthy, and Saleh (2019) argue that the implementation of AI and machine learning enables organizations not only to automate processes but also to predict changes and adapt to new conditions, thereby improving strategic planning. Similarly, McAfee and Brynjolfsson (2012) emphasize that big data analytics facilitates more informed decision-making by optimizing existing processes and forecasting future trends.

Thus, the role of information technology in reengineering is not only to improve current processes, but also to create new opportunities to increase efficiency, flexibility, and adaptability of organizations to a changing environment.

2.3.2 Types of Information Technologies Used in Reengineering

Reengineering uses various types of information technology. For example, Business Process Management (BPM) systems provide platforms for modeling, analyzing, managing, and optimizing business processes. Dumas et al. (2018) note that BPM systems allow you to visualize and analyze all steps of a business process, identifying bottlenecks and areas for improvement. For example, IBM implemented a BPM system to manage its internal processes, which reduced transaction processing time by 25% and increased overall productivity (IBM, 2017). BPM systems help businesses automate routine tasks, which is especially important in the context of growing data volumes and process complexity.

Electronic Document Management Systems (EDMS) automate document handling, reducing processing time and enhancing information accessibility. Goede (2019) highlights that Estonia's adoption of EDMS as part of its e-Estonia initiative significantly streamlined bureaucratic procedures and increased transparency in public services. In the education sector, implementing EDMS can expedite application processes and improve the management of academic records, contributing to more efficient and transparent educational administration.

Customer Relationship Management (CRM) systems are used to improve customer interactions and manage customer data. Chen and Popovich (2003) note that CRM systems help organizations better understand customer needs and tailor their services to their needs. For example, in the education sector, CRM systems help universities manage interactions

with applicants, track applications, and improve communication at all stages of the admissions process.

Decision Support Systems (DSS) facilitate the analysis of data and support strategic decision-making through modeling and forecasting. According to Power (2002), DSS leverage extensive datasets to simulate various scenarios, enabling organizations to anticipate potential risks and opportunities effectively. For example, Procter & Gamble (P&G) has implemented advanced analytics and AI-driven DSS to enhance its supply chain operations (2015). These systems have allowed P&G to reduce forecast errors by up to 40% in certain product categories, leading to improved inventory management and reduced stockouts. In the educational sector, DSS are employed to analyze student data, aiding in academic planning and resource allocation, thereby improving institutional effectiveness.

2.3.3 Examples of Successful Application of IT in Reengineering

In the corporate sector, many companies have successfully used IT to reengineer their business processes. For example, General Electric (GE) carried out a large-scale reengineering of its manufacturing and logistics processes, using information systems to automate and manage supply chains. This resulted in lower production costs and shorter lead times, which significantly improved the company's competitiveness (GE Annual Report, 2010). This experience shows how the use of information technology can radically change key business processes and improve operational efficiency.

Another successful example is Apple, which also used information technology to optimize manufacturing processes. The introduction of digital solutions allowed the company to reduce the time it took to bring new products to market, which gave it a significant competitive advantage (Lashinsky, 2012). BPR at Apple included supply chain

automation and improved capacity management, which allowed the company to remain a leader in innovation and efficiency.

In the field of education, the world's leading universities are also successfully using information technology to reengineer their processes. Stanford University implemented an electronic document management system to streamline the application process. This reduced processing time and increased transparency, making the admissions process more convenient and faster for both applicants and admissions officers (Stanford University Case Study, 2017).

The University of Southern California (USC) also used a CRM system to manage the student admissions process. This system helped to increase the level of personalization in working with applicants, providing more timely feedback at all stages of the process (USC, 2018). CRM systems in educational institutions not only improve interaction with applicants but also facilitate more efficient data management and forecasting of future student flows.

There are also examples of successful use of information technology in the reengineering of educational processes in Kazakhstan. Nazarbayev University is a pioneer in the use of advanced IT systems for reengineering student admissions processes. The implementation of an integrated application management system has significantly reduced application processing time, improved applicant data management, and increased process transparency. This example demonstrates how the introduction of modern technologies can improve the quality of service and improve the efficiency of admissions committees (Nazarbayev University Case Study, 2019).

These examples show that both globally and in Kazakhstan, the use of information technology in BPR brings significant benefits. Universities and companies that use IT to

automate and optimize their processes can more effectively manage resources and respond to the challenges of the modern world.

2.4 Reengineering of Business Processes in HE

Higher education systems around the world are undergoing major transformations under the influence of digitalization, globalization and increasing competition (Altbach et al., 2009; Marginson, 2011). These changes require universities not just to improve individual functions, but to comprehensively modernize organizational processes. Business process reengineering is considered an effective tool that can improve the adaptability and performance of universities in the new environment (OECD, 2019). Below, we will consider the features of business processes in higher education that determine the specifics of their reengineering.

2.4.1 Features of Business Processes in HE

Business processes in universities include a wide range of operations such as student admissions, academic management, financial administration and human resource management. These processes are unique to the education sector and are often complex and require high levels of precision and flexibility. Clarke (1998) notes that academic processes require a special approach as they involve multi-layered decision-making and interactions between different departments and stakeholders in the educational process.

In addition, universities must cope with unique data management challenges, especially in the context of digitalization. The increase in data related to students, curricula and the management of educational resources requires effective tools for processing and analysing them (West, 2004). Successful integration of these processes is key to maintaining high quality education and meeting rigorous academic standards. Ross et al. (2017) add that the implementation of digital technologies can significantly improve data

management and streamline administrative processes, allowing universities to remain flexible and ready for change.

Managing academic and administrative processes in universities also includes the need to meet high quality requirements for education, especially in the context of global competition. Research shows that BPR in education can help universities cope with these challenges and improve operational efficiency (Hassan, 2013). This is especially important for universities that seek to maintain their competitiveness in the international arena.

2.4.2 The Need for Reengineering in Universities

Universities today face significant challenges, including increasing student numbers, rising expectations for quality, and limited resources. Reengineering has become critical to improving efficiency and meeting the needs of students, faculty, and administrative staff. According to West (2004), reengineering enables universities to radically rethink their processes and implement innovative management approaches, which significantly improves their competitiveness.

One of the key reasons why universities turn to reengineering is the need to improve the quality of educational and administrative services. The introduction of IT systems, such as document management and automation systems, allows for streamlining data processing processes, reducing service delivery times, and increasing their transparency (Hassan, 2013). Ross et al. (2017) note that digital transformation facilitates more flexible management of academic processes, increasing the ability of universities to quickly respond to changes in labor market requirements and educational standards.

International examples show that centralized digital solutions can play a crucial role in improving admissions efficiency. For instance, in the United Kingdom, all undergraduate university applications are processed through the UCAS system (Universities and Colleges Admissions Service). UCAS acts as a centralized platform that

standardizes the application process for all universities, enhancing efficiency, transparency, and accessibility for applicants (Briggs, 2006; UCAS, n.d.). The centralized model significantly reduces administrative burden on individual universities and improves coordination between institutions and applicants.

Similarly, the University of Alabama successfully implemented a document management system, which led to a significant reduction in application processing time, as well as increased efficiency in interaction with applicants (Hale et al., 2007). This experience shows that universities can significantly improve their operational processes through reengineering, especially when it comes to managing large volumes of data and documents.

Kazakhstan also has successful examples of reengineering in higher education. Nazarbayev University implemented an advanced application management system that reduced application processing time, improved applicant data management, and increased process transparency. As a result, the university was able to improve the quality of service and attract the best students not only from Kazakhstan but also from other countries (Nazarbayev University Case Study, 2019). This example demonstrates how BPR can contribute to improving operational efficiency and increasing the international competitiveness of an educational institution.

Thus, BPR plays a key role in the transformation of higher education institutions, helping universities cope with the challenges of the modern world and increase their competitiveness. Systematic implementation of information technology and change management are the most important factors determining the success of reengineering in higher education.

2.5 Admission Processes at Universities in Kazakhstan

The admission process at universities in Kazakhstan includes several stages: application submission, document processing, entrance exams and enrollment. This process often requires significant time and resources, which can cause inconvenience for applicants and university staff. nanazarova (2020) notes that the lack of standardized procedures and low level of automation are the main problems of current admissions processes.

Admissions processes in Kazakhstan also face challenges such as limited transparency and insufficient availability of information for applicants, which can undermine trust in universities and complicate the application process (OECD, 2017; UNESCO, 2021).

Among the main problems of current admissions systems are:

- Long processing times for applications
- High reliance on paper-based procedures
- Lack of integration between digital platforms
- Limited transparency and accessible information for applicants

These issues can lead to delays, increased administrative workload, and decreased satisfaction among prospective students. In an increasingly competitive higher education landscape, such shortcomings may reduce the appeal of universities to potential applicants.

Reengineering intake processes can significantly improve their efficiency and quality. The introduction of automated application systems, electronic document management and online platforms for applicants can reduce application processing time, reduce paperwork and increase the transparency of the process (Kane et al., 2016).

The use of customer relationship management (CRM) systems allows universities to improve interactions with applicants, providing a more personalized experience and increasing satisfaction levels (Chen & Popovich, 2003).

2.6 Use of Information Technology in the Admission Process

The admissions process at universities may use various information technologies, such as online application platforms, electronic document management systems and CRM systems for interacting with applicants. These technologies make it possible to automate and streamline intake processes (Davenport, 1993).

The use of modern IT systems also includes the use of big data and analytics to predict and analyze applicant behavior, allowing institutions to better tailor their offerings and admissions strategies (Davenport & Ronanki, 2018). Moreover, it can significantly improve the admissions process by providing faster and more efficient application management, improved communication with applicants, and a reduced administrative burden on institutional staff (Al-Fedaghi, 2007; Davenport & Ronanki, 2018). For example, the use of CRM systems allows universities to better manage relationships with applicants and provide more personalized services (Chen & Popovich, 2003). IT can also help improve transparency in the admissions process, which is important for creating trust between institutions and applicants. Transparency and availability of information help applicants better understand the admissions process and receive the necessary information in a timely manner (Vial, 2019).

Kazakhstan is actively introducing information technology into university admissions processes to improve transparency, simplify procedures, and reduce application processing time. One of the key achievements has been the introduction of the Unified National Test Base (UNTB) and automated application systems such as eGov, which allow applicants to submit documents online without having to visit universities in person. In

addition, the National Testing Center (NTC) is implementing digital solutions for UNT, including computer testing and online results tracking. Some universities are developing their own admissions platforms integrated with government systems, which facilitates the management of competitive scores, grants, and quotas.

2.7 Advantages and Challenges of Reengineering at Universities in Kazakhstan

BPR in universities in Kazakhstan offers significant benefits that can significantly improve the efficiency of educational institutions. One of the key benefits is the reduction in time and costs for processing applications. Hammer (2010) notes that automation and optimization of processes significantly speed up the time it takes to complete tasks, which reduces transaction costs. Supporting this view, Fountaine et al. (2019) argue that modern information technology can automate routine operations, increasing productivity and reducing human errors.

Another important benefit is the increase in the accuracy and transparency of processes. Venkatraman (1994) emphasizes that the introduction of information technology makes processes more transparent, which helps to avoid errors and improves control over task execution. Westerman et al. (2014) add that digital transformation facilitates more transparent data management, which is an important aspect for educational institutions working with large volumes of information. These technologies not only increase efficiency, but also improve interaction with applicants and students. Chen and Popovich (2003) note that customer relationship management (CRM) systems contribute to an improved personalized approach to students, which leads to higher levels of satisfaction with their needs and expectations.

In addition, reengineering helps to optimize the use of resources and improve the overall efficiency of universities. Davenport (1993) argues that BPR helps universities improve resource management and reduce costs, which is especially important in the

context of limited budgets. Kane et al. (2016) add that modern technologies such as big data analytics allow universities to manage their resources more effectively by predicting needs and planning future activities.

However, alongside the benefits of reengineering, universities face several challenges, one of which is the high initial costs of implementing IT systems. For example, Davenport (2003) notes that installing new systems, integrating them, and maintaining them requires significant financial investment, which can be a significant barrier for organizations with limited budgets. Kane et al. (2016) add that such investments can make IT implementation particularly difficult in the context of economic constraints. These findings are consistent with the challenges faced by many developing countries, including Kazakhstan, where universities are undergoing digital transformation and are forced to modernize their infrastructure with limited financial resources.

Another major challenge is the need to train staff to work with new technologies. Hammer (2010) highlights that insufficient attention to training staff can lead to a decrease in the effectiveness of the implemented systems. Fountaine et al. (2019) also note that successful implementation of reengineering requires not only training but also continuous upskilling of staff so that they can effectively use new systems and approaches.

Employee resistance to change is another significant challenge that universities face when implementing reengineering. Kotter (1996) argues that employees accustomed to existing ways of working often show resistance to new processes, fearing loss of stability or increased workload. McAfee and Brynjolfsson (2017) add that fear of new technologies and change can be a major obstacle to the successful transformation of universities.

There is also the problem of integrating new IT systems with existing processes. Venkatraman (1994) points out that the incompatibility of new systems with existing

technologies can lead to disruptions and require additional investments in integration. Vial (2019) notes that successful integration requires careful planning and flexibility to minimize discomfort and avoid disruptions to the organization.

To overcome these difficulties, it is important to ensure support from university management. Kotter (1996) emphasizes that leadership plays a key role in the successful implementation of change. Management must be prepared to solve emerging problems and motivate staff to participate in the transformation process. Iansiti and Lakhani (2020) confirm that effective leadership helps universities adapt to new conditions and successfully implement innovative management approaches.

Investing in employee training is also an important factor for the successful implementation of reengineering. Hammer (2010) emphasizes that training should be a continuous process that helps employees adapt to new technologies and improves their competence. Davenport and Ronanki (2018) also note that training plays an important role in improving employee performance and helps minimize resistance to change.

In addition, for successful implementation of reengineering, it is important to gradually introduce changes and test new processes before their full implementation. Davenport (1993) emphasizes that a step-by-step approach to change allows universities to minimize risks and adapt new systems to existing conditions. Fountaine et al. (2019) support this approach, arguing that testing new processes allows identifying weaknesses and making necessary adjustments before full integration.

Finally, it is necessary to ensure continuous monitoring and evaluation of the effectiveness of new systems. Venkatraman (1994) points out that regular evaluation helps to identify potential problems and adjust in a timely manner. Kane et al. (2016) add that monitoring is an important tool for maintaining the sustainability and effectiveness of the implemented changes.

In conclusion, for successful implementation of reengineering in universities in Kazakhstan, it is necessary to develop a clear change management strategy. This strategy should include training and support for employees at all stages of the process, as well as continuous monitoring and evaluation of the implemented systems. As Kotter (1996) argues, effective change management and stakeholder involvement are key factors in the successful adaptation of new technologies and in enhancing the competitiveness of universities.

2.8 Gaps in Literature

Despite extensive research in the field of BPR and the use of information technology in educational institutions, there are certain gaps that require further study. Identifying these gaps can help develop new research directions and practical recommendations for universities.

Existing research on the application of business process reengineering (BPR) in universities predominantly focuses on Western countries and developed economies, where digital infrastructure and institutional readiness are more advanced (OECD, 2019). In the context of Kazakhstan and other developing nations, there is a notable gap in empirical studies, making it challenging to effectively adapt and implement global best practices within local higher education institutions. A recent study by Mukhatayev et al. (2024) highlights that Kazakhstani universities face systemic challenges in quality assurance, including outdated administrative processes and limited digital integration, underscoring the need for localized research and tailored BPR strategies.

Although the use of IT in universities has been widely studied, research specifically examining the integration of IT into the admissions process is still scarce (Davenport & Ronanki, 2018; Nazarbayev University Case Study, 2019). Particularly important are

studies that analyze specific cases and provide quantitative data on the impact of IT on the efficiency and quality of the admissions process.

Most studies focus on the short-term results of IT implementation and reengineering. There is a lack of long-term studies that assess the sustainability of these changes and their impact on the institution (Ross et al., 2017; Vial, 2019). Long-term studies are needed to understand the long-term impact and sustainability of reengineering.

The importance of cultural and organizational factors in the reengineering process is often underestimated. Kotter (1996) and others note that successful change implementation requires consideration of organizational culture and change management. However, most studies do not pay sufficient attention to these aspects, especially in the context of higher education institutions.

Research in reengineering and IT is often conducted in isolation from other disciplines. The lack of interdisciplinary approaches limits the ability to understand and solve problems holistically (Fountain et al., 2019). In the future, research that integrates knowledge from different fields such as management, information technology, education and sociology should be encouraged.

Personalization of intake processes using IT, such as CRM systems, has not yet been sufficiently studied. This direction has great potential for improving interaction with applicants and increasing their satisfaction (Chen & Popovich, 2003). More research is needed that analyzes successful cases and provides practical recommendations for personalizing admissions processes.

2.9 Theoretical Framework

The theoretical framework of the study is based on two key approaches: the theory of organizational change and institutional theory. These approaches complement each other, providing a comprehensive understanding of the reengineering processes in

universities in Kazakhstan, including both internal and external factors that influence the implementation of changes. Consideration of these theories allows not only to explain the causes of changes, but also to assess their mechanisms, obstacles and conditions for successful implementation.

2.9.1 Organizational Change Theory

The theory of organizational change, proposed by John Kotter (1996), offers a structured approach to change management in organizations. It is based on eight key stages:

1. Creating a sense of urgency (defining the need for change, identifying crisis points);
2. Forming a coalition of leaders (creating a team of change advocates);
3. Developing a vision and strategy (defining ultimate goals and steps to achieve them);
4. Communicating about changes (developing a communication strategy);
5. Removing barriers (identifying resistance and overcoming obstacles);
6. Achieving short-term victories (identifying and demonstrating the first successful results);
7. Reinforcing results (developing successes and expanding changes);
8. Institutionalizing changes (implementing changes into the organizational culture).

This approach emphasizes the importance of the human factor, including behavioral aspects, leadership, and managing resistance to change. For example, university staff may resist digitalization due to a lack of experience with new technologies or fear of increased workload. For effective change management, it is important to consider the cognitive and emotional aspects of resistance, as well as ways to reduce it, such as training, involving staff in the change process, and creating motivational incentives.

In terms of measuring the effectiveness of organizational changes, key indicators may include:

- The speed of staff adaptation to new processes;
- The level of employee and student satisfaction;
- The number of technical and administrative barriers eliminated;
- The proportion of successfully completed digital processes in the admissions system;
- The overall level of automation of admissions processes.

The application of organizational change theory in the context of reengineering admission processes in Kazakhstani universities allows not only to structure the digitalization process itself, but also to minimize the risks associated with resistance and misunderstanding of changes, and to increase the likelihood of their successful implementation.

2.9.2 Institutional Theory

The institutional theory developed by DiMaggio and Powell (1983) examines the influence of external factors on organizational change. According to this theory, organizations adapt their processes and structures under the influence of three types of institutional pressure:

- *Normative pressure* – government regulations, laws, standards that affect the activities of organizations;
- *Mimetic pressure* – copying successful practices of other organizations, especially in conditions of uncertainty;
- *Cognitive pressure* – the influence of public expectations, perception of effectiveness and significance of changes.

In the context of universities in Kazakhstan, institutional theory explains how external regulators, international standards and public demands shape the need for digitalization and modernization of admission processes. For example, normative pressure is reflected in the transparency and efficiency requirements of the national program “Digital Kazakhstan”, which encourages universities to switch to digital platforms for student admission. Mimetic pressure is reflected in the desire of Kazakhstani universities to adopt the best practices of foreign universities, introducing automated application processing systems, online testing and electronic document management. Cognitive pressure is formed by the expectations of applicants and their parents, who demand convenient, fast and transparent admission processes.

The following indicators can be used to assess institutional influence:

- Compliance of admission processes with regulatory requirements;
- The level of digitalization in comparison with international practices;
- Perception of transparency of admission among applicants and their parents;
- The number of universities implementing similar digital solutions;
- The degree of readiness of universities for further digital transformation.

Thus, institutional theory helps not only to explain the reasons for changes, but also to assess the degree of their compliance with external requirements and expectations, which is critical for the successful reengineering of university processes in Kazakhstan.

2.9.3 Application to Universities in Kazakhstan

The combination of organizational change theory and institutional theory provides an opportunity to analyze the reengineering of admissions processes considering both internal and external factors. Organizational change theory focuses on managing the change implementation process within an organization, while institutional theory emphasizes the influence of external pressures and regulatory requirements. Together,

these approaches provide an opportunity to understand how internal barriers, such as employee resistance, and external challenges, including government policy requirements, can be addressed to achieve a successful outcome. For example, the introduction of digital technologies into the admissions process can be tailored to minimize employee resistance through training and communication, while simultaneously meeting regulatory requirements and student expectations.

This theoretical framework is key to understanding how Kazakhstani universities can effectively implement the reengineering of their admissions processes. It helps to interpret the barriers and opportunities that arise in the process of digitalization and offers tools for achieving sustainable change. This study can contribute to the development of practical recommendations for the implementation of information technologies in the context of the Kazakhstani educational system, considering the unique context of national and international standards.

2.10 Summary

This chapter reviewed the existing literature on the digitalization of administrative processes in higher education, the principles of BPR, and the challenges associated with implementing digital technologies in university admissions. The review highlighted both the potential benefits of digitalization, such as increased efficiency, accessibility, and transparency, and the barriers, including technical limitations, organizational resistance, and gaps in user digital literacy. Theoretical frameworks related to organizational change and institutional adaptation were also discussed to provide a basis for interpreting the study's findings. The insights gained from the literature informed the development of the research design and guided the formulation of the study's key questions, which are explored in the following chapters.

Chapter 3: Methodology

This chapter outlines the research design, data collection methods, and analysis procedures used to investigate the impact of digital technologies and BPR on the university admissions process in Kazakhstan. A qualitative approach was employed, combining semi-structured interviews with students and admissions officers and document analysis of relevant policies and regulations. The chapter describes the sampling strategy, ethical considerations, data collection instruments, and thematic analysis techniques applied to ensure a rigorous and credible interpretation of the data. Triangulation of multiple data sources was used to enhance the reliability and validity of the findings. Overall, this chapter provides a detailed account of how the research was conducted to address the study's objectives and research questions.

3.1 Research Design

The qualitative case study design was chosen for this study because it allows for a deeper understanding of the process of IT implementation at a particular university. This design is suitable because it allows for a focus on the study of a specific context and phenomenon in its natural environment, which provides an opportunity to examine in detail how different participants (admissions staff, administration, students) perceive and adapt to change (Yin, 2018). A qualitative approach allows for contextual consideration of the phenomenon under study, which is particularly important in studying reengineering processes in universities in Kazakhstan. The use of interviews in a case study contributes to a deeper understanding of organizational change by revealing the dynamics of processes, the complexity of interactions, and the influence of institutional factors (Merriam & Tisdell, 2016). This approach not only collects the subjective experiences of participants but also analyzes the contextual conditions that influence the perception and implementation of digital transformations. The case study provides a comprehensive

analysis, allowing for considering multiple perspectives and identifying factors that influence the success of IT implementation in the educational process (Creswell, 2013). This design is also suitable for identifying hidden problems and opportunities for improvement, which makes it particularly relevant for researching processes in educational institutions. Using a qualitative case study helps to collect in-depth and detailed data, which makes it an optimal choice for this study.

3.2 The Case and Rationale

The study was conducted at a major university in central Kazakhstan that was actively implementing information technology in its educational and administrative processes, including the student admissions process. The university was chosen because it was in the process of reengineering aimed at digitalizing administrative procedures, making it a suitable case for studying the impact of IT on change management. The university developed and implemented automated application systems, digital platforms for processing applicant data, and integrated solutions for interaction between admissions committees and other structural units. The key participants in this process were:

1. admissions committees that used digital tools to process applications, check documents, and interact with applicants;
2. students and applicants who adapted to the new conditions of submitting documents and interacting with the university through digital platforms.

The study allowed to study in detail how these groups adapted to the changes, what barriers and problems they experienced in the process of implementing IT, and how digitalization affected the transparency and efficiency of admissions. The focus on one university provided an in-depth analysis of the institutional and organizational factors influencing the process of admissions reengineering in the context of digitalization.

3.3 Sampling and Participants

Two groups of participants were recruited for the study: admissions staff and students. Participants were selected using purposive sampling (Palinkas et al., 2015), ensuring that those most closely involved in the admissions process and change implementation were included.

Admissions staff were included in the study because they were the ones who interacted directly with applicants, processed applications, and made admissions decisions. Their participation provided insight into the challenges of implementing new digital solutions and the impact of these changes on day-to-day processes.

Although it was originally planned to include IT staff, during data collection it became apparent that student admissions were being handled through a system that the university had commissioned from an external vendor. As a result, the IT department was not closely involved in the admissions process and their participation in the study was deemed inappropriate.

The students represented the first and second years of study, since, according to the order of the Minister of Science and Higher Education of the Republic of Kazakhstan (2023), first-year students submitted documents through the online system, and second-year students completed the application procedure offline. This approach allowed to study the impact of the change implementation from different perspectives and get a more complete picture of the current processes.

Communication with the admissions office staff was carried out through official emails sent through the university's administrative channels. Students were recruited through posts on social media such as Instagram and Facebook, as well as through invitation emails sent through the university platforms. The invitation explained the

purpose of the study, and participants could consent to participate by replying to the email or message.

Once consent was obtained, a convenient time for the interview was agreed with the participants. All interviews were conducted in a comfortable and private setting, or online if the participants preferred a remote format. The sample consisted of 13 participants, including 4 admissions staff members and 9 students, of whom 5 were second-year and 4 were first-year students, ensuring sufficient depth of analysis in accordance with the principle of data saturation (Creswell, 2014).

3.4 Data Collection Tools

This study used semi-structured interviews and document analysis as the primary data collection methods. Semi-structured interviews provided the opportunity to ask pre-scripted questions while maintaining the flexibility to explore participants' responses in depth (Rubin & Rubin, 2005). This method is particularly suited to exploring participants' perceptions and experiences with information technology implementation (Merriam & Tisdell, 2016). Interviews were conducted with three groups: admissions staff, IT department staff, and students, providing a multi-faceted perspective on the issue under study.

Protocol for Admissions staff

The purpose of the interview with admissions officers was to explore their experiences with IT systems in the student admissions process. The interview consisted of 7 main and 18 following questions that cover topics such as description of current work, impact of IT on the admissions process, support from management, and potential improvements. Examples of questions include:

- 1) How has the admissions process changed since the implementation of IT systems?
- 2) What challenges have you encountered in adapting to new technologies?

- 3) How has management supported you in the transition to digital systems?

Protocol for IT Department staff

The interview with the IT department aimed to understand their role in the digitalization of the admissions process. The questions focused on the IT implementation processes, employee support, and system performance evaluation. The protocol included 8 main and 15 following questions. Examples of questions:

- 1) How did the process of integrating IT systems into the existing university infrastructure proceed?
- 2) What key performance indicators were used to assess the success of the project?
- 3) Are there plans to further develop the IT systems?

Protocol for students

The interview with students is aimed at exploring their experience of submitting applications through IT systems and interacting with the admissions committee. The protocol included 6 main and 9 following questions that cover topics such as the application experience, ease of interaction with the admissions committee, and suggestions for improving the process. Examples of questions:

- 1) How would you describe the application process to the university?
- 2) Have you encountered any difficulties when submitting documents?
- 3) What aspects of the application process could be improved?

The full interview protocols are provided in Appendices D and E.

In addition, an analysis of documents such as official admissions policies available in the public domain, including regulations of the Ministry of Science and Higher Education of the Republic of Kazakhstan, was conducted. These documents were used to compare interview data with official documentation to identify differences between stated and actual practice (Bowen, 2009). Internal university documents, such as instructions and

guidelines on the use of information systems for student admission, reports on the implementation of IT systems, data on the results of monitoring their effectiveness, and student admission reports for the last three years (which indicate the number of students who applied online and offline) were also reviewed. These documents allow for an assessment of the extent of the implementation of IT systems and compare them with practical results. This could provide a more complete understanding of the processes (Creswell, 2013).

3.5 Data Collection Procedures

The data collection procedures were aimed at investigating the reengineering of admission processes and IT use in universities in Kazakhstan. They included the development of interview protocols and requests for access to documents. Permission from the universities was required to comply with ethical standards and gain access to information (Creswell, 2014).

The data collection process began after the approval of the ethical application and continued until January 31, 2025. Data collection took place in several stages. After receiving permission from the university management, a request was sent to the Graduate School of Education of Nazarbayev University to receive an official invitation for the participation of the selected university in the study. At the same time, official invitations were sent to the admissions staff by email. Students were invited to participate through social media such as Instagram and Facebook. The student recruitment process took less time (about 3–4 weeks), while waiting for responses from the admissions staff was delayed for 2 months due to their workload during the winter admissions period.

After obtaining confirmation from the participants, informed consent forms were sent to them to inform them about the purpose of the study, ethical standards and participants' rights (Creswell, 2013). A convenient time was scheduled for the interviews,

which lasted approximately 15–20 minutes for students and 25–30 minutes for admissions officers, allowing for detailed data collection without overwhelming participants, in line with the recommendations of Brinkmann (2013). All interviews were audio-recorded for further analysis.

In terms of document data collection, only publicly available documents such as admission policies posted on university and government department websites were analyzed. It was originally planned to include the university's internal institutional records, including student admission reports, but these documents could not be accessed. This process was conducted in parallel with the interviews: open sources and available admission reports were first analyzed to compare actual practice with the information obtained during the interviews (Bowen, 2009; Yin, 2018).

3.6 Data Analysis

The data analysis was carried out in several stages. The data analysis methods were chosen to provide a structured and reliable approach to interpreting the information obtained from the interviews and document analysis.

First, all interviews conducted as part of the study were transcribed. The transcripts provided access to the exact content of the participants' responses and preserved the context of their perceptions. This enabled the full information to be extracted from the interviews and provided a basis for further analysis. During this stage, particular attention was paid to the accuracy and completeness of the transcripts to avoid data loss.

Second, thematic analysis was used to analyse the data, which enabled the identification of key themes and categories in the information collected (Hsieh & Shannon, 2005). The analysis was conducted using a combined (inductive and deductive) approach (Braun & Clarke, 2006), which ensured that both pre-determined and emerging themes emerged from the data. Inductive analysis revealed new patterns and categories not

envisaged by the theoretical framework, while deductive analysis ensured that the information was structured according to the pre-defined aspects of the study. The thematic analysis process involved several stages, based on Saldana (2016) and Braun and Clarke (2006):

1. *Initial familiarization with the data* – re-listening to the audio recordings and reading the transcripts to identify key ideas.
2. *Coding* – systematic identification of meaningful text fragments. Example codes included “*server overload*”, “*difficulty with electronic signature*”, “*manual acceptance of documents*”, and “*positive user experience with eGov interface*”.
3. *Categorization* – codes were grouped into broader categories. For instance, codes such as “*server overload*” and “*manual acceptance of documents*” were categorized under “*Technical Difficulties and Server Overload*”.
4. *Development of themes* – categories were refined into major themes reflecting the key aspects of the study. Key themes included “*Perception of Digital Technologies in the Admission Process*”, “*Key Barriers to Digitalization*”, “*Factors for the Successful Reorganization of the Admissions Process*”, and “*Potential for System Improvement*”.
5. *Review and refinement* – final themes were formed, which represented the main findings of the study.

For example, the theme “*Key Barriers to Digitalization*” combined categories such as “*Technical Difficulties and Server Overload*”, “*Insufficient Digital Literacy*”, and “*Limitations of Admission Automation*”. A related quotation illustrating technical barriers is: “We are faced with a situation where students apply en masse, and as a result, the system freezes. At such times, we have to accept their documents manually” (Admissions Officer C).

The interview data were complemented by the analysis of documents, such as administrative regulations and digitalization strategies. The document analysis was conducted in accordance with the recommendations of Bowen (2009) and Yin (2018) and included the following steps:

1. *Document selection and classification* — only publicly available documents, such as admission regulations posted on university and government department websites, were analyzed.
2. *Content analysis* — key points from the documents were extracted and systematized according to themes identified during the interviews.
3. *Comparative analysis* — information from the documents was compared with the interview data to identify discrepancies or confirm findings.
4. *Identification of patterns* — key trends and strategies related to the digitalization of admissions processes were identified.

Finally, to increase the reliability of the results, a triangulation technique was used based on the comparison of data from two sources: interviews and documents (Denzin, 1970). Comparison of interview information with document data allowed us to identify inconsistencies, clarify conclusions, and better understand the context of digitalization implementation. For example, interviews with admissions officers complemented the analysis of official documents by identifying practical aspects and potential problems of digitalization implementation.

The selected data analysis methods were closely related to the qualitative research design. Interview transcription ensured the completeness of the data, thematic analysis structured the information, and triangulation increased the reliability of the findings by minimizing the subjectivity of interpretation. This approach allowed us to establish a

connection between theoretical frameworks, such as theories of organizational change and institutional theory, and empirical data.

3.7 Ethical Considerations

All ethical standards and regulations were strictly followed during the study. Ethical approval was obtained from the GSE Ethics Sub-Committee prior to the commencement of data collection. Participants were provided with full information about the purpose of the study, the methods of data collection, potential risks and benefits, and their rights, including the right to withdraw at any time without penalty. This process included the use of an informed consent form, which each participant signed prior to the interview. The informed consent included the following elements:

The study followed all key ethical principles aimed at protecting the rights and interests of the participants. All participants were provided with detailed information about the purpose of the study, the methods used, and the ways in which the collected data would be used, which contributed to the formation of informed consent (Creswell & Poth, 2016). Particular attention was paid to the voluntary nature of participation: respondents could refuse to participate at any stage without explanation and without any negative consequences. In addition, they had the right not to answer questions that made them uncomfortable (Silverman, 2013). Confidentiality and anonymity of the data were ensured by replacing names with codes and storing information in encrypted, password-protected files. Only the researcher had access to these data, which ensured that the participants could not be identified (Patton, 2015). All data protection measures were strictly observed: audio recordings of interviews were stored in password-protected electronic folders, and paper documents were stored in a locked cabinet. Upon completion of the study, all materials were destroyed to prevent unauthorized use (Yin, 2018). Participants were also informed of their right to request deletion of the data they provided, which was done

immediately upon request (Flick, 2018). To ensure open communication, they were provided with contact information for both the researcher and the supervisor so that they could ask further questions or raise concerns about the study.

The main risk was the potential emotional or professional discomfort that participants might experience during the interviews, especially if the issues discussed concerned changes in their work or the impact of the introduction of information technology. To minimize this risk, the interviews were conducted in a private setting and participants were informed of their right to terminate the interview at any time or to refuse to answer certain questions.

In addition, there was a risk of psychological stress for students, especially if they experienced difficulties during the application process or adapting to new IT systems. To mitigate this risk, the interview questions were formulated in a way that did not put pressure on the participants. Participants also had the opportunity to skip any questions that made them feel uncomfortable (Denzin & Lincoln, 2011).

Another potential risk was the breach of data confidentiality. To minimize this risk, all audio recordings of interviews and other data were encrypted and stored on password-protected devices accessible only to the researcher. Identifying data was removed from the transcripts and replaced with codes, minimizing the possibility of revealing the identities of the participants (Creswell, 2013). Risk mitigation procedures also included informing the participants through consent forms of all possible risks and their rights to confidentiality and refusal to participate. This ensured that the study complied with ethical standards and the protection of the participants' data (Tracy, 2020). In this way, all possible risks were minimized through strict adherence to ethical standards and data protection principles.

3.8 Positionality

The central object of the study was the process of adaptation and use of modern information technologies in the admissions offices of Kazakhstani universities in the context of a case study. The study focused on the factors that contributed to or hindered the successful integration of IT into these processes. My interest in this topic was due to my professional activities at the Republican State Enterprise on the Right of Economic Management “Digital Government Support Center”, where my main task was the analysis and optimization of processes, including through the implementation of digital solutions. My professional position provided me with a unique opportunity to better understand the research problem, since I was closely involved in the digitalization processes in government agencies. However, this also created potential risks, such as bias or the influence of my experience on the interpretation of the data. To mitigate these risks and ensure objectivity, I took the following steps:

1. I used neutral wording in the questions, avoiding pressure on the respondents.
2. I applied the data triangulation technique, combining several data collection methods (interviews, document analysis), which allowed me to get a more balanced picture of the real situation (Creswell, 2014).

These measures helped to minimize the influence of my professional position on the research and ensured its reliability and objectivity.

3.9 Summary

The chapter described the research design, sample, data collection and analysis methods, and measures to comply with ethical standards. Thematic analysis was used with data triangulation to enhance reliability. Measures to protect the rights of participants and minimize risks were considered. The next chapter will present the results of the study.

Chapter 4: Findings

The aim of this case study was to examine the impact of digital technologies on the admission process in Kazakhstani universities from the perspective of students who have already completed the admission process, as well as admission staff directly involved in the admission process. The researcher believed that a better understanding of the digitalization of the admission process would help universities optimize the process and reduce administrative barriers for applicants. This chapter presents the key findings from the semi-structured interviews with students and admissions officers, as well as the analysis of documents related to the admission process.

The following four key categories emerged from the data analysis:

1. Perception of digital technologies in the admission process,
2. Major barriers to digitalization,
3. Factors for successful reorganization of the admission process,
4. Possibilities for improving the system.

Each category was further divided into themes, which were carefully analyzed and interpreted with the help of effective quotations to give the reader a complete understanding of the impact of digital technologies on the admissions process and possible ways to improve it.

4.1 Perception of Digital Technologies in the Admission Process

The first research question aimed to determine the perception of digital technologies in the admissions process and their impact on the simplification of document submission, application processing and accessibility of information. To do this, respondents were asked questions regarding their experience of using digital platforms, the advantages and disadvantages of this approach. During the analysis of the data, two main themes emerged:

1. The benefits of digitalization and
2. Reliability of digital solutions.

These themes allowed me to examine in detail how students and admissions officers perceive digitalization, as well as what challenges and prospects they see in it.

4.1.1 Benefits of Digitalization

The digitalization of application processes, according to the majority of respondents, has significantly simplified and accelerated the admissions procedure, while reducing the administrative burden on admissions officers. The eGov platform has become a key tool that has automated the main stages of admission and ensured the availability of document submission for applicants from different regions of Kazakhstan. As interviews have shown, the process of admission to higher education institutions in Kazakhstan is conventionally divided into two stages:

1. participation in a competition for educational grants and receiving social support;
2. submission of documents and enrollment in universities for study in educational programs.

Both stages are currently implemented in a digital format through the eGov platform. Applicants are actively using the opportunity to apply for an educational grant online, which, according to them, has made it possible to avoid the need for personal presence at universities. Previously, participation in the grant competition involved visiting the university at the place of residence and in-person registration, whereas now this procedure is available remotely. One of the students noted: “I applied through eGov while sitting at home. This saved me time and money on travel” (Student B). Such statements demonstrate that automation is particularly beneficial for applicants living in rural or remote areas, where travel to the city can take a significant amount of time and resources.

In addition, students rated the usability of the platform positively. According to their feedback, the eGov interface was intuitive, which facilitated quick and hassle-free application completion. As one participant noted: “There were no problems when filling out the application, I was able to do it quite quickly” (Student C). This highlights not only the technical accessibility, but also the user orientation of the system.

Furthermore, the digitalization of the application process has significantly reduced the workload of the admissions office. The move to online application has reduced the number of students coming to the university in person, which in turn has reduced the workload of the staff and reduced the need for additional staff. One admissions officer noted: “Previously, the entire process was paper-based and we spent a lot of time processing documents. Now, students can upload their data to the eGov system, and this makes our work much easier” (Admissions Officer B). This comment demonstrates how the use of digital platforms helps to streamline administrative processes, allowing staff to focus on higher-priority tasks. Another employee highlighted the impact of digitalization on HR policy:

To accept applicants, we hired temporary workers — students or part-time employees, since admissions are only held twice a year. We used to need more people, but now, due to the decrease in the number of applicants coming in person to apply for grants, we are hiring fewer workers. (Admissions Officer A)

Thus, the introduction of electronic services not only improves the user (applicant) experience, but also contributes to a more rational use of university resources, including reducing the cost of temporary staff and increasing the efficiency of the core Admissions team.

4.1.2. Reliability of Digital Solutions

When implementing digital solutions in the admissions processes of universities, it is especially important to consider their reliability, the key element of which is information security — the protection of users' personal data. In the context of the transition to electronic document management, ensuring confidentiality and security is becoming an integral requirement. Respondents noted that in order to submit an application, it is necessary to undergo authorization through a personal account using an electronic digital signature (EDS). One of the students emphasized: “To submit via eGov, you need an EDS key.” Another student clarified: “Minors must submit an application through a personal account and a parent's EDS.”

These statements confirm that the use of EDS allows for reliable user identification and provides secure access to the system, eliminating the possibility of submitting an application on behalf of another person. This strengthens the trust in the system on the part of applicants and their families. In addition, authorization via EDS ensures the legal significance of the submitted documents, which allows universities and government agencies to effectively interact electronically. Thus, the reliability of digital solutions is manifested not only in technical stability, but also in a high degree of security, transparency and formality of all procedures.

4.2 Key Barriers to Digitalization

One of the key tasks of digitalization of university admission processes is to remove barriers faced by admissions committees and applicants. This study revealed that the main problems of digitalization remain technical failures, insufficient digital literacy of users, and limitations in online document submission. Admissions committees find themselves in a difficult situation when they are forced to process applications in an

unstable system, as well as help applicants who are experiencing difficulties with electronic services.

Based on the respondents' responses, these problems were divided into three main categories: 1) technical difficulties and server overload, 2) insufficient digital literacy of applicants, and 3) limitations in online document submission. Detailed explanations and examples from the interviews are provided below.

4.2.1 Technical Difficulties and Server Overload

Despite the obvious benefits of digitalization, one of the key challenges identified in the study remains the technical instability of the eGov platform, especially during peak periods. As interviews showed, technical failures regularly occur in the last days of application submission, when the number of system users increases sharply. This leads to slow server performance, errors when loading files, and temporary unavailability of functionality. Admissions officers reported that such failures force them to operate in conditions of high uncertainty. For example, an employee of Admissions Office C noted: "We are faced with a situation where students apply en masse, and as a result, the system freezes. At such times, we have to accept their documents manually." This indicates a partial return to offline practices, which contradicts the original goal of digitalization — to reduce paperwork and administrative workload. In the face of a digital failure, the workload on employees not only does not decrease, but also increases: they are forced to simultaneously monitor system problems, provide consultations, and also physically accept documents.

For students, the consequences of technical problems are lost time, stress, and a disrupted sense of predictability in the admissions process. One respondent (Student F) reported: "I tried to upload documents via eGov, but the system gave an error. I uploaded files three times, but nothing changed, so I had to go to the university." Such cases

undermine trust in a system that is positioned as a convenient and reliable tool. It is important to note that system failures can be particularly detrimental to applicants in remote areas. As another respondent pointed out, traveling to the university requires significant time and money. When an online service is unavailable, the benefits of digitalization are leveled out and social inequality is exacerbated: those who do not have the technical ability to quickly adapt find themselves in a vulnerable position.

Some staff also noted that in the event of a failure, the number of requests from applicants asking for clarification on the next steps increases, which increases the volume of communication work. There is a risk of misunderstandings and mistakes on the part of applicants, especially if there are no clear instructions on how to act in case of failures. This points to the need not only for technical modernization of the eGov platform, but also for the development of response protocols in case of system failures — for both employees and users. Thus, technical instability of eGov during the period of mass acceptance of applications does not just represent short-term inconveniences, but creates systemic difficulties that affect both the efficiency of admissions committees and equal access of students to educational opportunities.

4.2.2 Insufficient Digital Literacy

The analysis of interviews revealed that applicants' lack of digital literacy is a significant barrier to the effective use of the eGov platform. Admissions committees are forced to spend additional resources and time explaining the application process, especially in terms of obtaining and using an electronic digital signature (EDS). This problem is noted as recurring during the period of mass application submission.

Several students reported difficulties with EDS during the interviews. For example, one respondent stated: "I tried to register through eGov, but I was unable to activate the EDS" (student H). Such situations slow down the application process and can lead to

delays at all stages, since the EDS is a key tool for identity verification in the system.

Admissions committees, according to employees, find themselves in a position where they have to provide technical support to students to avoid missing submission deadlines.

In addition to the EDS, applicants face inconsistencies in the requirements for the formats of uploaded documents, which also causes difficulties. One student noted: “The eGov system kept asking for files in different formats. Once I was told to upload a PDF, then a JPEG, then a PDF again” (Student A). These difficulties indicate a lack of standardization of the digital platform, as well as a lack of clear and accessible instructions.

As a result, admissions committees are recording an increase in the volume of inquiries from applicants on technical issues, which leads to an increased workload for employees and reduces the efficiency of processes. This also entails an increase in the stress level of applicants, especially those who are interacting with government digital services for the first time.

The analysis shows that applicants, especially from regions with limited access to digital infrastructure, may experience difficulties at both a technical and navigational level. The lack of clearly structured information, difficulties with file formats, as well as an insufficient understanding of the algorithm of actions in the eGov system make the application process less transparent and predictable for users. This, in turn, affects the overall user experience and reduces the perceived accessibility of the digital tool.

Thus, the level of digital literacy of applicants becomes an important factor determining the effectiveness of the digital application system. In the absence of sufficient support from the platform and institutional support, this limitation may hinder the implementation of the stated goals of digitalization — simplifying, accelerating and increasing the accessibility of admission processes.

4.2.3 Limitations of Admission Automation

Despite the introduction of digital solutions, the second stage of admission – enrollment at the university – still relies on traditional paper-based procedures. The interview analysis revealed that even after submitting an application via the eGov platform, applicants are required to submit the original documents to the admissions office in person. This obligation, based on current regulations, reduces the efficiency of digitalization and leads to duplication of data and processes. Admissions officers confirmed the need to verify the original documents submitted electronically. One respondent noted: “Even if a student applies via eGov, we have to manually register their documents and check the originals” (Admissions Office B). This indicates that digital and paper channels operate in parallel rather than as a single system, which increases the amount of manual work and slows down the admissions process.

An analysis of publicly available regulations shows that universities are required to provide applicants with the option to submit documents online without refusal. However, during the interviews, it was noted that the University refused to accept online applications at the second stage, citing the requirement to submit original documents. For example, one first-year student reported: “I heard that University A does not accept online applications, so we came to ... and submitted documents in person” (Student D). This decision by the university returns the process to an offline format, nullifying the potential of digitalization, especially for applicants from other regions. This practice affects the perception of digital systems as not fully reliable and complete. For students, this means the need to come to the university, which is accompanied by time, money and logistical costs, especially in the case of living outside the city. Several students also pointed out the problem of long queues when submitting documents: they had to come to the university early in the morning and wait until lunch. “We arrived at seven in the morning and waited for our turn

until almost one in the afternoon” (Student A). “There were a lot of people, the line moved slowly, everything was filled in manually” (Student C). These comments reflect the poor organization of admissions under high workload conditions, which in turn exacerbates stress among applicants and reduces their satisfaction with the process.

In the context of mass student admissions, participants reported that the load on university infrastructure, including both physical resources and personnel, tends to increase. Admissions committee staff shared that they often experience overload, as certain operations still must be performed manually despite the availability of a digital platform. According to participants, this situation complicates the realization of key principles such as efficiency, transparency, and accessibility, which are central to the state policy of digitalization in education. Their experiences suggest that the digitalization process remains fragmented: while one stage of the admissions procedure occurs online, subsequent stages still require in-person interaction. This inconsistency in processes was perceived by both applicants and admissions committee members as creating additional tension and administrative burden.

4.3 Factors for the Successful Reorganization of the Admissions Process

Despite the existing limitations and challenges associated with the digitalization of admission to universities in Kazakhstan, the results of the study showed that the first stage of submitting applications — participation in the competition for an educational grant — was generally successfully implemented. At the same time, the process remains in the testing and refinement stage, as technical issues persist and challenges related to applicants’ limited digital literacy continue to be observed. Two key factors influenced the successful implementation of digitalization at the first stage:

1. integration of digital platforms with centralized databases;

2. systematic training of admissions officers to work effectively in the new digital environment.

Each of these factors will be discussed in more detail in the following sections.

4.3.1 Database Integration

One of the key changes that contributed to the optimization of the admissions process was the introduction of a centralized database and the integration of the eGov platform with the educational grants distribution system. This integration allowed for partial automation of the initial stages of application processing and a reduction in the amount of manual work of admissions committees. Previously, university staff had to accept and process applications themselves, fill in the data manually and transfer it to centralized databases. One respondent described the situation as follows: “When students submit applications to the university, we manually upload them into the system and transfer them to the Central Database. However, if all students applied online, this process would be automated, eliminating the need for manual intervention...” (Admissions Officer C).

With the transition of some applicants to eGov, the number of applications processed manually decreased. Although offline applications still remain in the system, their share has decreased significantly. This has allowed universities to optimize the allocation of resources. As another respondent noted:

We used to hire more staff at the first stage, but when students started applying online, the number of students applying offline, even if it was a small number, decreased, so we hired fewer people. Because all applications went directly to the central grant distribution system. (Admissions Officer D)

The integration of digital platforms not only reduced the administrative burden, but also changed the structure of the admissions committees. In some cases, this led to a reduction

in temporary positions previously created for the admissions campaign period. Instead of mass data entry and application verification, employees began to do more consulting and coordination work, as well as resolve technical issues that applicants encountered during the online application process.

In addition, data centralization increased coordination between different structures: universities, the Ministry of Education and technical platform operators. This contributed to faster processing of information and a reduction in the number of errors in data transmission. Thus, the introduction of a centralized database and integration with eGov became an important step towards the transition to a digital model of admissions process management. This change not only improved the application logistics, but also affected internal administrative processes, the redistribution of tasks and the organizational structure of the work of admissions committees.

4.3.2 Staff Training

Another important factor in the successful implementation of digitalization was the training of admissions officers. The introduction of new digital tools required universities to train specialists who could effectively work with platforms such as eGov, as well as provide technical and information support to applicants. As interviews showed, at the initial stage, many employees experienced difficulties in mastering the new systems. One respondent noted: “When we first started working with different systems, many employees did not understand how to use them. After training, it became much easier” (Admissions Officer A).

To overcome these difficulties, universities organized training seminars and briefings, during which employees were familiarized with the eGov platform interface, the application submission algorithm, as well as typical problems faced by applicants. This

training allowed staff not only to adapt to the changes, but also to change their initial attitude towards the digitalization process. As another employee emphasized:

Initially, when the Ministry proposed to us the automation of the admissions process, we did not want any changes and did not want to accept their proposals. But when they explained it to us in detail, we began to understand how this would significantly simplify our work. It was only necessary to train employees and show them how to work in the system. (Admissions Officer D)

These statements emphasize that staff training performs not only a technical function, but also an adaptive one, helping to overcome resistance to change. Increasing the digital literacy of employees increased their confidence in working with the system and allowed for better support of applicants.

4.4 Potential for System Improvement

Despite the progress made in digitalizing the admissions process, the results of the study showed that the system is still incomplete and requires further improvement. The analysis identified two key areas where there is potential for development:

1. strengthening the technical infrastructure of the eGov platform;
2. introduction of digital mechanisms for document authentication.

Each of these areas reflects the need to improve both technical solutions and organizational approaches. The following subsections will examine in detail the specific improvements that, according to respondents, can improve the efficiency and accessibility of the digital admissions system.

4.4.1 Improving the Technical Infrastructure of eGov

One of the most frequently mentioned issues in the interviews was the insufficient technical support of the eGov platform, especially during peak periods. During the days of mass application submission, usually closer to the end of the admissions deadline, the

system experiences overload, which leads to failures, delays in processing requests and temporary unavailability of functionality. One of the students shared his experience:

“Initially, I tried to apply online through eGov, but the site was overloaded. So I had to submit documents in person offline” (student A).

Such cases demonstrate that the unstable operation of the platform negates the key benefits of digitalization — remoteness, efficiency and convenience. Applicants lose confidence in the system and are forced to resort to traditional methods of submission, which, in turn, creates an additional burden on universities and neutralizes the effect of digital solutions. Admissions officers also confirmed the presence of technical failures during periods of mass activity. According to them, during such periods, the number of complaints and requests for assistance increases significantly, and there is a need to manually accept documents from those who were unable to submit them online. This leads to an increase in the volume of work, the emergence of queues and a decrease in the efficiency of the process organization.

The respondents suggested several areas for improving the technical infrastructure. In particular, the need to modernize the server architecture, increase computing power and implement automatic scaling systems during periods of increased load was emphasized. The need for backup servers and duplicate channels that could ensure uninterrupted operation of the system in the event of unexpected failures was also mentioned. Thus, the insufficient stability of the eGov platform is a serious obstacle to the full digitalization of the admissions process. The sustainability, stability and reliability of the technical infrastructure are considered by the respondents as a basic condition for increasing trust in the system and expanding its use among applicants and university employees.

4.4.2 Introducing Digital Document Verification

Currently, the process of document authentication requires a personal visit to the Admissions Office. In order to fully transition to a digital admissions format, it is necessary to implement a system of electronic document verification via eGov. Director of admissions department noted, “If the system could automatically verify the authenticity of documents, students would not need to come to the university” (Director of admissions department).

When analyzing the Standard Rules for Admission to Education in Educational Organizations Implementing Higher and Postgraduate Education Programs, it was revealed that information on a number of documents, including an identity card, documents on general secondary (secondary general), technical and vocational (primary and secondary vocational, post-secondary) education, a medical certificate, an electronic UNT certificate and an electronic certificate of awarding an educational grant, are provided to the university through an information system. These data are requested from the relevant state information systems through the “electronic government” gateway, provided that they are available in the databases. In the future, with full integration and updating of all necessary information in state information systems, it may be possible to eliminate the requirement to provide originals of the specified documents, which will improve the efficiency and convenience of the admission procedure. Automating this process will eliminate the need for physical submission of documents and make the admission procedures completely digital.

4.5 Summary

This chapter presented the results of semi-structured interviews with students and admissions officers, as well as an analysis of documents related to the admissions processes. The first part of the chapter examined the perception of digital technologies in

the admissions process, including their benefits and reliability of digital solutions. The second section analyzed the key barriers to digitalization, such as technical problems, insufficient digital literacy, and the need for personal presence when submitting documents. The third section discussed the factors contributing to the successful reorganization of admissions processes, including database integration and staff training. The last part of the chapter highlighted possible areas for improving the system aimed at eliminating existing barriers and increasing the effectiveness of digital technologies. Additional quotations from interviews are provided in Appendix C.

The next chapter will discuss the main findings that answer the research questions, as well as their comparison with previous studies and literature on this topic.

Chapter 5: Discussion

This section examines the main findings of the study in the context of existing theories and empirical data presented in the literature review. It discusses the findings on impact of BPR on the digitalization of admission to universities in Kazakhstan, its theoretical foundations and practical implementations, as well as possible problems and limitations identified during the study. The findings are compared with theories of organizational change (Kotter, 1996) and institutional theory (DiMaggio and Powell, 1983), which allow us to understand both internal and external factors influencing the digital transformation of university processes.

5.1 The Impact of Reengineering on the Digitalization of the Admission Process in Universities in Kazakhstan

One of the central findings of this study was the confirmation that the implementation of BPR in Kazakhstani universities contributed to a significant increase in the efficiency of the student admissions process. This is reflected in the simplification of the application process, reduction of the administrative burden and increased transparency.

This finding is consistent with the seminal work of Hammer and Champy (1993), who define BPR as a radical rethinking of processes to achieve breakthrough improvements. Davenport (1993) highlights that in the university context, the effectiveness of BPR is closely linked to digital technologies. In this study, this link is illustrated by the use of the eGov platform.

Current international research confirms that the digitalization of administrative processes at universities, including admissions, can significantly enhance organizational efficiency (OECD, 2021). Thus, the study by Marullo et al. (2021) showed that successful implementation of BPR at EU universities is accompanied by mandatory transformation of organizational culture, digital leadership and cross-functional coordination. Similarly,

EUA (2022) emphasizes the importance of systemic integration of IT platforms with databases and regulatory frameworks, which creates a sustainable digital ecosystem at universities.

However, in the context of Kazakhstan, the implementation of BPR faces a number of challenges: technical failures, overload of digital systems (see Section 4.2.1), and regulatory restrictions requiring the provision of paper originals of documents (Section 4.2.3). These obstacles indicate the limited impact of digitalization if BPR is implemented without taking into account the institutional and cultural conditions. As Winner (1986) emphasizes, technologies do not exist in a vacuum: their effectiveness is determined by the context of application. This calls into question the sustainability and depth of digital change in the absence of regulatory support and institutional leadership.

In this regard, it is useful to consider the results through the lens of Kotter's (1996) theory of organizational change, which suggests that sustainable transformations are possible only with a clear change strategy, the formation of a coalition of leaders, and the removal of barriers within the organization. In the case of Kazakhstani universities, the study showed that the implementation of BPR often relies only on technological initiatives, while the stages of change communication, staff motivation, and institutionalization of new processes are either insufficiently implemented or completely absent. This limits the success of transformations even with the availability of technological solutions.

Additionally, institutional theory (DiMaggio & Powell, 1983) helps explain the remaining barriers, in particular the regulatory pressure to require paper originals, as well as the mimetic desire of universities to follow traditional practices despite the availability of digital capabilities. This shows that the implementation of BPR in Kazakhstani universities is limited not only by technical readiness, but also by institutional expectations, external regulatory frameworks, and management culture.

Conceptually, this broadens the understanding of BPR: it should be seen not simply as a method of process optimization, but as a strategy for complex organizational transformation, including changes in the regulatory environment, the development of digital literacy of staff, and institutional interaction. In practice, this means that Kazakhstani universities need to not only invest in digital infrastructure, but also promote systemic changes in governance, legislation, and approaches to organizational learning. Otherwise, reengineering will remain a fragmented initiative with limited impact, unable to transform the fundamental structure and philosophy of admissions processes.

5.2 Interaction Between Universities and Applicants in the Context of Digitalization

Findings of the study revealed that the introduction of digital solutions such as eGov and elements of CRM systems has allowed Kazakhstani universities to improve access to the application process, simplifying interactions between universities and applicants. However, despite these positive developments, there are limitations in the personalized approach to interactions – which is particularly evident in applicants' difficulties in navigating systems and a lack of digital support during the application process (see Section 4.2.2).

Chen and Popovich (2003) emphasize that customer relationship management (CRM) systems in the educational environment serve not only for administration but also for creating a stable, personalized contact with students. This is especially important at the stage of student recruitment. However, as Kaplan and Norton (1992) note, the implementation of such systems requires accurate accounting of performance indicators and adaptation to the real needs of users.

In the context of Kazakhstani universities, this means that it is not enough to simply digitize the application process. It is necessary to ensure that digital interfaces and procedures are supported, with clear interaction logic and the possibility of receiving

personalized assistance. This is supported by the findings of Fountaine et al. (2019), who emphasize that the success of digital transformation largely depends on the user experience and the ability of IT systems to adapt to the behavioral and cognitive characteristics of the target audience.

In comparison with international practices presented in the literature (e.g. Stanford University Case Study, 2017; USC, 2018), it can be noted that in developed universities, personalization of digital interaction with applicants is ensured through integrated CRM systems, a notification system, and specialized digital assistants. In Kazakhstan, however, as the study showed, digitalization of interaction is limited to the administrative function, not covering the full range of user support. This indicates that the potential of digitalization is not fully realized, which is in line with the critical remarks of Westerman et al. (2014), according to which digital transformation should be accompanied by changes in organizational processes, and not be a purely technological update.

From the perspective of Kotter's (1996) theory of organizational change, such implementation of systems without simultaneous transformation of internal processes, motivation of personnel and sustainable user support limits the impact of digital initiatives. The absence of steps to train personnel to interact with digital tools, the absence of teams of digital "champions" and a focus on involving students in digital processes indicate that the transformations were not accompanied by a full-scale change strategy.

Institutional theory (DiMaggio & Powell, 1983) also helps explain why, even with the availability of technological solutions, personalized interaction remains underdeveloped. Universities can reproduce external requirements (e.g., use eGov) due to normative pressure, without transforming internal processes. Mimetic pressure (focus on "basic compliance" rather than on real user convenience) leads to the fact that

digitalization is limited to formal changes, without affecting the deep practices of supporting applicants.

Conceptually, this highlights the need to move from a technological solution (e.g., “uploading an application via eGov”) to a digital support system for applicants, where the technology not only facilitates the submission of documents, but also guides, advises and adapts to the user.

In practice, this means that:

- eGov and university system interfaces need to be supplemented with step-by-step instructions and prompts;
- it is important to take into account the diversity of users’ digital skills when designing platforms;
- universities should actively use data from CRM systems to adapt communications with applicants (e.g., mailings, reminders, individual messages);
- digital support needs to be strengthened, including hotlines and online chats.

Thus, the interaction of universities and applicants in the digital environment should not be limited to the functional automation of document acceptance, but should be built on the principles of personalization, sustainable support and involvement. Only in this case, digital transformation will not be a technical project, but a full-fledged change in the university culture of interaction with future students.

5.3 Automation of Decision-Making and its Impact on Transparency and Fairness

The findings of this study show that the introduction of digital platforms in Kazakhstani universities, in particular the eGov system, contributes to the formalization and unification of admission procedures. Automation of the submission and initial processing of applications reduces the influence of the human factor and increases the transparency of competitive selection. This is especially important in conditions where

applicants previously faced difficulties in accessing information or uneven admission practices between universities.

This result echoes John Rawls's (1971) concept of justice, which states that institutions should be designed to ensure equal opportunities in accessing social goods. In the context of higher education, this means ensuring a universal, understandable and transparent mechanism for accessing learning. However, as Westerman et al. (2014) point out, digitalization alone does not guarantee equal access: it only becomes a source of justice when accompanied by changes in processes and governance that focus on the user and minimize barriers.

In international practice, the automation of student admissions is accompanied by the implementation of end-to-end digital solutions, digital identification, and contactless enrollment processes (Stanford University Case Study, 2017; USC, 2018). Such systems particularly emphasize the role of integration between information platforms and university systems. In Kazakhstan, despite the existence of the eGov electronic portal, the study showed that the requirement to provide original documents still remains (see Section 4.4.2), which negates some of the benefits of digitalization and limits access for remote or vulnerable groups of students.

Thus, automation may not only promote principles of justice but also, if not supported by institutions, may reinforce existing inequalities. As Davenport (1993) argues, the effectiveness of digital solutions is determined not only by their architecture but also by the degree of institutional coordination. Insufficient integration between systems, the lack of digital verification, and requirements for face-to-face presence demonstrate the inconsistency between the stated goals of digitalization and the actual administrative practices.

This highlights that digital justice requires not only equal technical access, but also the removal of hidden organizational and regulatory barriers. In practice, this means the need for:

- full integration of university platforms with government databases for automated digital verification of document authenticity;
- elimination of the requirement for physical originals in the presence of digital confirmations;
- strengthening the regulatory framework that allows universities to rely on eGov data as legally valid grounds for admission.

Thus, automation can indeed strengthen the principles of transparency and fairness in admissions, but only if it is accompanied by regulatory reform and institutional coordination. Without these elements, digitalization remains a technical modernization without a genuine effect of transforming educational equality.

5.4 Summary

This chapter analyzed the key findings of the study in light of theoretical approaches and relevant international literature. The discussion helps identify the conceptual and practical implications of implementing digital solutions and reengineering admission processes in Kazakhstani universities, as well as identify institutional and organisational barriers that limit the effectiveness of the transformation. Emphasis is placed on the importance of an integrated approach that includes technological, regulatory and managerial components. The next chapter will present a summary of the findings of the study, as well as practical recommendations for universities and suggestions for further research directions.

Chapter 6: Conclusion

This chapter provides a synthesis of the study by reflecting on its overall contributions, strengths, and limitations. It offers an integrated discussion of the research findings in relation to the broader context of digital transformation in higher education admissions. In addition, the chapter presents practical recommendations for policymakers, university administrators, and technology developers aimed at addressing the challenges identified during the study. Finally, areas for future research are outlined to guide further exploration of effective strategies for digitalizing administrative processes in higher education.

6.1 Key Findings of the Study

This study aimed to examine the impact of digital technologies and BPR approaches on admission processes in Kazakhstani universities. Thematic analysis of semi-structured interviews with students and admissions officers, as well as analysis of regulatory and organizational documents, showed that the introduction of digital solutions—particularly the eGov platform—contributes to increased accessibility, processing speed and transparency of applications. However, the data obtained indicate that the digitalization process remains fragmented and incomplete. The lack of systemic institutional support, technical platform failures during periods of mass workload, insufficient digital literacy of applicants and the continuing requirement to provide paper originals of documents hinder the achievement of full automation of processes. This leads to an increase in the administrative burden on employees and reduces the level of trust from users.

One of the key findings of the study is that BPR principles can significantly improve the efficiency of administrative procedures at universities, provided that the digital transformation is comprehensive. This requires the removal of regulatory barriers,

institutional leadership, the development of digital competencies among employees and applicants, and the adaptation of processes to the real needs of users. In addition, the study revealed limited opportunities for personalizing interactions with applicants through digital channels. Despite the presence of individual elements of CRM systems, their potential for building more personalized communications remains underutilized, which reduces the quality of user experience.

The study pays particular attention to the contradiction between the stated goals of digitalization—such as ensuring equal access to education and reducing barriers—and the actual practices, such as the mandatory submission of original paper documents. This requirement undermines the value of automation, increases costs for applicants from remote regions, and hinders the achievement of digital equality and fairness. Thus, successful digitalization of admission processes in Kazakhstani universities requires not only technological solutions, but also a comprehensive transformation of organizational structures, regulations, and the culture of interaction with users.

6.2 Strengths and Limitations of the Study

The strength of the study is its empirical focus and emphasis on the perception of change by direct participants in the process - applicants and university administrators. This allowed us to obtain valuable information “from the bottom up” and identify hidden aspects of digitalization that are not always reflected in official reports.

Methodologically, the work is characterized by a consistent use of thematic analysis, triangulation of data sources and compliance with ethical standards, which strengthens the reliability and validity of the findings. Conceptually, the study combines organizational and institutional theories, allowing us to consider digitalization as a multidimensional transformation process.

There are certain limitations to this study that need to be considered when interpreting the results. First of all, the study was conducted in a specific regional and institutional context, which limits the possibility of directly transferring the findings to other conditions. This approach, on the one hand, allows for a deeper understanding of the local specifics of digitalization and the implementation of BPR, and on the other hand, emphasizes the importance of considering contextual differences when adapting the results to other universities or regions. In addition, not all aspects related to the long-term sustainability of digital transformations and their impact on educational processes could be covered within the time and resource constraints of this project.

6.3 Recommendations for Research, Policy and Practice

From a policy perspective, it is recommended to ensure full integration of the eGov platform with university and government databases for automated digital verification of documents. To this end, it is necessary to eliminate regulatory requirements at the state level that require the provision of paper originals and to adopt regulations recognizing digital documents as legally valid. Such measures will create a regulatory basis for the full digitalization of admission processes.

In practice, universities should develop inclusive digital interfaces that consider the different levels of digital literacy of applicants and implement digital navigation elements - step-by-step instructions, video tutorials, chatbots. It is also necessary to use CRM systems not only as application databases, but also as personalized communication tools: automated notifications, individual reminders, segmented mailings. An important area is training admissions officers in digital consulting and support skills so that they can effectively support applicants in the online environment.

Future research could aim to assess the long-term impact of digitalization on the quality and fairness of access to higher education, including considering social, territorial

and digital unevenness. Comparative studies between regions or universities with different levels of digital maturity and digital infrastructure are also promising. Special attention should be paid to studying the digital transformation of universities in the context of public policy strategies and international trends, which will allow for the development of more sustainable and flexible digitalization models for the education sector.

6.4 Reflection on the Thesis and Research

Working on this research was not only an academic but also a transformative personal experience. Immersing myself in real stories of students and staff allowed me to deeply understand the complexity of digital reforms and the importance of organizational context. I learned to think critically, systemically, and see human processes behind technical solutions. This project strengthened my motivation to continue my career in the field of digital transformation of education and became a solid foundation for future research and practical initiatives. Having completed this work, I realize how important empathy, contextual thinking, and an interdisciplinary approach are to creating sustainable and inclusive digital solutions in education.

References

- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
<https://doi.org/10.1191/1478088706qp0630a>
- Brennen, J. S., & Kreiss, D. (2016). Digitalization. *The International Encyclopedia of Communication Theory and Philosophy*, 1–11.
<https://doi.org/10.1002/9781118766804.wbiect111>
- Briggs, S. (2006). An exploratory study of the factors influencing undergraduate student choice: The case of higher education in the United Kingdom. *Studies in Higher Education*, 31(6), 705–722. <https://doi.org/10.1080/03075070601004333>
- Brinkmann, S. (2013). *Qualitative interviewing*. Oxford University Press.
- Budhrani, K., Ji, Y., & Lim, J. H. (2018). Unpacking conceptual elements of smart learning in the Korean scholarly discourse. *Smart Learning Environments*, 5(1), 1–26. <https://doi.org/10.1186/s40561-018-0069-7>
- Chen, I. J., & Popovich, K. (2003). Understanding customer relationship management (CRM): People, process and technology. *Business Process Management Journal*, 9(5), 672–688. <https://doi.org/10.1108/14637150310496758>
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). SAGE Publications.
- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.
- Davenport, T. H. (1993). *Process innovation: Reengineering work through information technology*. Harvard Business School Press.

- Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review*, 96(1), 108–116.
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147–160.
- Flick, U. (2018). *An introduction to qualitative research* (6th ed.). SAGE Publications.
- Fountaine, T., McCarthy, B., & Saleh, T. (2019). Building the AI-powered organization. *Harvard Business Review*, 97(4), 62–73.
- Hammer, M. (2010). *Reengineering work: Don't automate, obliterate*. Harvard Business Review Press.
- Hammer, M., & Champy, J. (1993). *Reengineering the corporation: A manifesto for business revolution*. Harper Business.
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288.
<https://doi.org/10.1177/1049732305276687>
- Iansiti, M., & Lakhani, K. R. (2020). *Competing in the age of AI: Strategy and leadership when algorithms and networks run the world*. Harvard Business Review Press.
- Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D., & Buckley, N. (2016). Aligning the organization for its digital future. *MIT Sloan Management Review*. <https://sloanreview.mit.edu/projects/aligning-for-digital-future/>
- Kotter, J. P. (1996). *Leading change*. Harvard Business Review Press.
- McAfee, A., & Brynjolfsson, E. (2017). *Machine, platform, crowd: Harnessing our digital future*. W. W. Norton & Company.

- Mukhatayev, Y., Omarova, G., & Kulzhanova, A. (2024). Reforms in higher education in Kazakhstan: Challenges of digital transformation. *Journal of Central Asian Education Policy*, 3(1), 45–61.
- OECD. (2021). *Digital education outlook: Pushing the frontiers with AI, blockchain and robots*. OECD Publishing. <https://doi.org/10.1787/589b283f-en>
- Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). SAGE Publications.
- Procter & Gamble. (2015). *Procter & Gamble sustainability report*.
<https://us.pg.com/sustainability/environmental-sustainability/2015-report/>
- Rawls, J. (1971). An egalitarian theory of justice. *Philosophical Ethics: An Introduction to Moral Philosophy*, 365–370.
- Ross, J. W., Beath, C. M., & Sebastian, I. M. (2017). Digitally enabled business transformation: Opportunities and challenges. *MIS Quarterly Executive*, 16(3), 197–213.
- Rubin, H. J., & Rubin, I. S. (2005). *Qualitative interviewing: The art of hearing data* (2nd ed.). SAGE Publications.
- Rummler, G. A., & Brache, A. P. (1995). *Improving performance: How to manage the white space on the organization chart* (2nd ed.). Jossey-Bass.
- Saldana, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). SAGE Publications.
- Stanford University Case Study. (2017). *Improving document management at Stanford University*. <https://www.stanford.edu>
- Taylor, F. W. (1911). Principles and methods of scientific management. *Journal of Accountancy*, 12(3), 3.

- Turban, E., Pollard, C., & Wood, G. (2018). *Information technology for management: On-demand strategies for performance, growth and sustainability*. John Wiley & Sons.
- UCAS. (n.d.). How to apply. Retrieved April 28, 2025, from <https://www.ucas.com/applying>
- UNESCO. (2020). *Digitalization of educational systems: Global trends and prospects*. <https://unesdoc.unesco.org>
- UNESCO. (2020). *Education in a post-COVID world: Nine ideas for public action*. <https://en.unesco.org/news/education-post-covid-world-nine-ideas-public-action>
- UNESCO. (2021). *Digital transformation of higher education in Central Asia: Challenges and opportunities*. UNESCO Institute for Information Technologies in Education. <https://iite.unesco.org/publications/digital-transformation-central-asia/>
- Venkatraman, N. (1994). IT-enabled business transformation: From automation to business scope redefinition. *Sloan Management Review*, 35(2), 73–87.
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, 28(2), 118–144. <https://doi.org/10.1016/j.jsis.2019.01.003>
- Weller, M. (2020). *25 years of ed tech*. Athabasca University Press. <https://doi.org/10.15215/aupress/9781771993050.01>
- West, M. A. (2004). *Effective teamwork: Practical lessons from organizational research*. Blackwell Publishing.
- Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading digital: Turning technology into business transformation*. Harvard Business Review Press.
- World Bank. (2020). *Remote learning, distance education and online learning during the COVID-19 pandemic: A resource list*.

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/964121585254860581>

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE Publications.

Appendix A: Declaration of the Use of Generative AI



Thesis Title: Using Modern Information Technologies as a Basis for Re-Engineering

University Business Processes: Admission Processes in Kazakhstan

I hereby declare that I have read and understood NUGSE's policy concerning appropriate use of AI and composed this work independently (please check one):

- with the use of artificial intelligence tools, or
- without the use of artificial intelligence tools.

During the preparation of this thesis, I used Grammarly to check for grammatical errors, ChatGPT for brainstorming and creating subtopics, QuillBot to paraphrase my sentences for better structure, and Scribbr to ensure compliance with APA 7 style.

I also declare that I

- am aware of the capabilities and limitations of AI tool(s),
- have verified that the content generated by AI systems and adopted by me is factually correct,
- am aware that as the author of this thesis I bear full responsibility for the statements and assertions made in it,
- have submitted complete and accurate information about my use of AI tools in this work, and
- acknowledge that there may be disciplinary consequences if I have not followed NUGSE's guidelines regarding AI appropriate use.

Name: Ainur Aitmash
Date: 28.04.2025

Signature:

Appendix B: Invitation Letter by Email

Subject: Invitation to Participate in a Research Study

Dear *[Recipient Name]*,

My name is Ainur and I am a Master's student in the Educational Leadership program at Nazarbayev University. As part of my thesis, I am conducting a study to examine the impact of information technology implementation on student admission processes at universities in Kazakhstan.

Your experience and input as an *[Admissions staff/IT department staff/student]* will be extremely valuable to this study. I would like to invite you to participate in an interview that will take approximately 40–60 minutes. During the interview, we will discuss your experience with information systems as well as your views on how IT has impacted the student admission process.

Participation is completely voluntary and all information you provide will remain confidential. The interview will be audio recorded to ensure data accuracy and the recordings will be stored in encrypted form. Once the study is completed, all recordings will be destroyed after three years.

If you are willing to participate or have any questions, please reply to this email and we will arrange a convenient time for you to interview.

Thank you in advance for your time and consideration. Your input will be very important to the success of the study.

Respectfully yours,

Ainur Aitmash

+77029420108

ainur.aitmash@nu.edu.kz

Appendix C: Invitation Letter via Social Networks

Hello!

My name is Ainur, I am a master's student in the Educational Leadership program at Nazarbayev University, and I am conducting a study on how the implementation of information technology affects the university application process. I am looking for students who are willing to share their application experiences to help me better understand this process.

If you are a 1st/2nd year student and applied *online/offline*, I would greatly appreciate it if you could participate in a short interview (40–60 minutes). Your opinion is very important, and all information will remain confidential.

If you are willing to help, please write to me via private message or email: ainur.aitmash@nu.edu.kz

Thank you very much for your time and support!

Appendix D: Interview Protocol for Admission Staff

Introductory statement:

Thank you for taking the time to speak with me today. My name is Ainur and I am a PhD student in the Educational Leadership Program at Nazarbayev University. I am conducting research as part of my thesis and your input would be invaluable to its success.

Explanation of the purpose of the interview:

My research aims to examine the implementation of information technology in the admissions process of students in higher education institutions. This interview will take approximately 40–60 minutes. During the conversation, I will ask several questions that will help me better understand your experiences and perceptions of these changes. To facilitate note-taking and ensure the accuracy of the data, I would like to record our interview today.

Explanation of ethical issues:

Before we begin, could you please confirm your consent to participate? For your information, only I, as the researcher, will have access to the audio recordings, which will be destroyed three years after the completion and publication of the study. It is important to note that: (1) all information will remain strictly confidential, (2) your participation is completely voluntary and you can stop at any time if you feel uncomfortable, and (3) the study does not involve any harm to the participants. Thank you again for agreeing to participate in this interview.

General questions (introduction)

1. Can you tell about yourself?
1. F: What is your current position?
2. F: How many years have you been working in this field?
3. F: How long have you been working in this particular institution?

Key questions about working in the admissions office

Description of current work

2. How would you describe your job in the admissions process?
1. F: What tasks do you perform?
2. F: How do you interact with other staff and applicants?

The Impact of IT on the Admissions Process

3. How has the admissions process changed since the introduction of the online service for admission of applicants?

1. F: Do you feel that your work has become more efficient?
2. F: What tasks have become more automated?
3. F: Has this affected your interactions with applicants and other employees? If so, how?
 4. Are there any advantages to using IT systems in the admissions process? If yes, what are they?
1. F: What aspects of work have become easier?
2. F: Do you notice a reduction in errors due to the use of IT?
 5. Have you encountered any difficulties in adapting to new technologies? If so, what were they?
1. F: How did you cope with these difficulties?

Support and improvements

 6. How does management support staff in the transition to IT systems?
1. F: What types of support are provided?
2. F: Are there training or educational sessions?
3. F: Do you feel that management is sufficiently involved in the IT implementation process?
4. F: What forms of support might you be missing?
 7. In your opinion, is there anything that could be improved in the admission process?
1. F: What functions or processes need to be improved?
2. F: What improvements could make your work more efficient?
3. F: Are there any examples of successful practices that could be adopted?

Appendix E: Interview Protocol for Students

Introductory statement:

Thank you for taking the time to speak with me today. My name is Ainur and I am a PhD student in the Educational Leadership Program at Nazarbayev University. I am conducting research as part of my dissertation and your input would be invaluable to its success.

Explanation of the purpose of the interview:

My research aims to examine the implementation of information technology in the admissions process of students in higher education institutions. This interview will take approximately 40–60 minutes. During the conversation, I will ask several questions that will help me better understand your experiences and perceptions of these changes. To facilitate note-taking and ensure the accuracy of the data, I would like to record our interview today.

Explanation of ethical issues:

Before we begin, could you please confirm your consent to participate? For your information, only I, as the researcher, will have access to the audio recordings, which will be destroyed three years after the completion and publication of the study. It is important to note that: (1) all information will remain strictly confidential, (2) your participation is completely voluntary and you can stop at any time if you feel uncomfortable, and (3) the study does not involve any harm to the participants. Thank you again for agreeing to participate in this interview.

General Questions (Introduction)

1. Can you tell us a little about yourself?
1. F: What year are you studying?
2. F: How did you apply for admission (online or offline)?

Key questions about applying

Application experience

2. How would you describe the university application process?
1. F: Which steps of the process did you find most convenient?
3. Did you encounter any difficulties while applying?
1. F: What challenges did you encounter?
2. F: Did you receive the support you needed to overcome these challenges?

Interaction with the admissions staff

4. Were there any moments when you needed help or clarification from the admissions staff?

1. F: How easy was it to interact with the admissions staff during the application process?
2. F: How quickly did you get answers to your questions?

Evaluation of the application process and recommendations for improvement

5. Did you find the application process quick and efficient?

1. F: How quickly were your documents processed?
2. F: Were there any delays during the application process?
1. What aspects of the application process did you like and what aspects do you think could be improved?

Appendix F: Written Informed Consent Form

Introduction. You are invited to participate in a research study entitled “Using Modern Information Technologies as a Basis for Re-Engineering University Business Processes: Admission Processes in Kazakhstan”.

Procedures. The aim of this study is to examine the impact of information technology implementation on student admission processes at a university in Kazakhstan. The research methodology is based on a qualitative design using semi-structured interviews and document analysis to gain an in-depth understanding of the processes. This interview will take approximately 40 minutes to complete.

Risks. The potential risks of participating in this study are: emotional or professional discomfort, a risk of psychological stress, and a risk of breach of confidentiality.

Benefits. Anticipated benefits from this study are add the potential benefits to science and practice. The study may help to better understand how digitalization affects the work of universities and offer recommendations for improving efficiency. This study may also contribute to improving the student admission process, which will benefit other educational institutions undergoing digital transformation. Participants will have the opportunity to express their opinions on the IT implementation process.

Compensation. No tangible compensation will be given. A copy of the research results will be available at the conclusion of the study. All participants will receive an email notification informing them of the study’s conclusion, and those interested will have the opportunity to request access to the final results.

Confidentiality & Privacy. Any information obtained during this study will be kept strictly confidential. All audio recordings and transcripts will be anonymised and stored in encrypted files on a password-protected computer. Only the researcher will have access to this data. Paper documents will also be stored in a secure location with limited access. Recordings will be kept for three years after the completion of the study and then destroyed. Despite all reasonable efforts to ensure data security, complete confidentiality cannot be guaranteed.

Voluntary Nature of the Study. Participation in this study is strictly voluntary, and if agreement to participation is given, it can be withdrawn at any time without prejudice.

Points of Contact. It is understood that should any questions or comments arise regarding this project, or a research related injury is received, the Principal Investigator, Ainur Aitmash, +7.702.942.01.08, ainur.aitmash@nu.edu.kz should be contacted. Any

other questions or concerns may be addressed to the Supervisor, Dr. Alper Çalikoğlu, alper.calikoglu@nu.edu.kz or NUGSE Research Ethics Committee, gse.irec@nu.edu.kz.

Statement of Consent.

I, _____
_____,

Give my voluntary consent to participate in this study.

The researchers clearly explained to me the background information and objectives of the study and what my participation in this study involves.

I understand that my participation in this study is voluntary. I can at any time and without giving any reasons withdraw my consent, and this will not have any negative consequences for myself .

I understand that the information collected during this study will be treated confidentially.

Signature: _____ Date: _____

Researcher:

Signed _____ Date _____

Appendix G: Example Codes and Themes

Theme	Subtheme (code)	Quotations
Benefits of Digitalization	Save money and time	I applied through eGov while sitting at home. This saved me time and money on travel
	Quickly	There were no problems when filling out the application, I was able to do it quite quickly
	User friendly	When I am filling out the application, I realized that it is not so hard, even user-friendly
Technical difficulties	Server overload	We are faced with a situation where students apply en masse , and as a result, the system freezes.
	The system freezes	I tried to submit documents through eGov several times, but the system froze .
	Errors in eGov	I uploaded all documents via eGov, but the system gave an error
Lack of digital literacy	Problems with digital signature	R: Didn't you know that you can do it through eGov? P: I knew, but I had problems with the digital signature key
	Unclear instructions	I didn't immediately understand how to use eGov . I had to ask my friends for help, as the instructions weren't clear enough
Online Submission Restrictions	Need for a physical visit	Since I was a minor (17 years old) at the time, I had to submit my documents offline. A representative must physically go to the branch office .
	Insufficient integration of eGov with universities	According to the regulations, we must verify the authenticity of the documents. Therefore, even those who apply through eGov must bring the originals to the university
Staff training	Technical support	When we first started working with different systems, many employees did not understand how to use them. After training , it became much easier